

The Ban on Extra-Fees for Beneficiaries of the CMU-C Health Cover: What Consequences for Physicians and Dentists in Private Practice?

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Abstract – Whilst it is forbidden to charge patients with CMU-C health cover fees in excess of the reimbursable regulated fee (or extra-fees), so as to make their access to care easier, field experiment studies report discrimination against the latter by physicians. This issue is approached here from the angle of healthcare supply, using four waves of longitudinal administrative data on physicians in private practice between 2005 and 2014. We examine whether this ban on excess fees for CMU-C beneficiaries, i.e. charging them fees in excess of the standard social security-negotiated fees agreed under the public health insurance scheme, generates a real financial constraint for Sector 2 physicians (those who charge extra-fees) and dentists in private practice. Estimates show a significant drop in the average extra-fees per procedure when physicians accept more CMU-C patients in their practice. Even if costs are transferred (cost-shifting), with other patients being charged higher extra-fees, this is not enough to offset the financial impact. However, this restriction does not have a negative impact on total fees for Sector 2 specialists, general practitioners and dentists, as they increase their volume of activity at the same time.

JEL Classification: I11, I13, I18, C23

Keywords: physicians in private practice, dentists, Supplementary Universal Health Cover (CMU-C), extra-fees, panel data

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The CMU-C supplementary universal health cover plan (*Couverture maladie universelle complémentaire*) was introduced on 1 January 2000 to offer free supplementary health cover for individuals whose income is below a set level. Individuals eligible for this health cover, like all people at the bottom of the income scale, tend to be in poorer health than the rest of the population of the same age (Tuppin *et al.*, 2011 and CNAM, 2017). In order to remove the financial barriers to accessing healthcare, the regulator has banned physicians from charging CMU-C health cover beneficiaries fees in excess of the reimbursement rates and has limited the prices dentists can charge for prosthetic procedures. In 2019, the last year in which this scheme was in operation, 5.9 million people in France, or 8.8% of the total population, had CMU-C cover.¹ On 1 November 2019, CMU-C merged with the complementary health insurance voucher scheme known as *Aide à la Complémentaire Santé*² (ACS) to become the *Complémentaire Santé Solidaire* (CSS), which continues to restrict prices.

Does CMU-C really improve its beneficiaries' access to healthcare? The available studies offer contrasting results. Two studies show that it limits out-of-pocket expenses and the incidence of giving up treatment for financial reasons (Desprès *et al.*, 2011 ; Ricci, 2011). Two econometric cross-sectional data analyses also show that, other things equal, beneficiaries of the CMU-C cover have as much recourse to health care from GPs, specialists and dentists as individuals with private complementary health insurance (Raynaud, 2003 ; Jess, 2015). On the other hand, a regression discontinuity analysis does not show that individuals eligible for CMU-C have better access to healthcare than those whose income is just above the eligibility threshold³ (Guthmuller & Wittwer, 2017).

Actual access to treatment for people with CMU-C health cover raises the question of their acceptance by health professionals. There is an unequal distribution of CMU-C patients between physicians, with concentration effects that cannot be explained solely by the location of the people eligible for this cover across the regions (Boisguérin & Pichetti, 2008 ; Cases *et al.*, 2008). Moreover, a field experiment conducted in Val-de-Marne in 2005 reported a rate of refusal to treat individuals with CMU-C cover of 4.8% among GPs, 41% among specialists and 39% among dentists (Desprès, 2010). These difficulties in accessing treatment are confirmed by a more recent nationwide controlled experiment conducted in 2019, where 9% of requests for

appointments with dentists, 11% with gynaecologists and 15% with psychiatrists resulted in a refusal to see patients with CMU-C health cover and ACS vouchers (Chareyron *et al.*, 2019). These studies show that there is a greater incidence of refusal to treat among physicians who are free to charge unregulated fees (i.e. those in Sector 2), and an analysis of their comments reveals that the ban on extra-fees is a motive for them refusing to treat (Desprès & Lombrail, 2017). Discrimination against CMU-C patients can also, all else being equal, have more qualitative consequences, as with shorter consultations (Breuil-Genier & Goffette, 2006).

Taking that finding of discrimination as its starting point, this paper tackles the issue from the perspective of healthcare supply. The objective is to examine whether the ban on charging extra-fees for CMU-C patients puts a significant financial constraint on physicians and dentists in private practice.⁴ Does treating CMU-C patients entail a drop in their fees? Or do they manage to maintain their overall fees through increased volume of activity or through cost-shifting, that is, by charging other patients higher extra-fees? These adjustment mechanisms lead to different conclusions in a public policy perspective. A rise in extra-fees through cost-shifting would involve an increase in out-of-pocket expenses for the patients concerned. If a compensatory increase in the level of activity was not in response to the increased care needs of certain patients, it would equate to induced demand behaviour, which is costly to the social security. In order to guide policies for combating refusal to treat, questions should therefore be asked about the current remuneration of physicians and dentists in private practice for treating patients with CMU-C health cover. The value of assessing these mechanisms is heightened by the fact that rate restrictions have been extended to holders of ACS vouchers in 2012 for extra-fees and in 2017 for prosthetic treatment rates, and subsequently maintained under the CSS plan which now encompasses CMU-C and ACS.

We use data from a matching of two administrative sources: one from the *Caisse Nationale*

1. The income eligibility threshold for CMU-C at that time was €746 a month for a single person living in Metropolitan France., i.e. 74% of the poverty threshold.

2. The ACS was a voucher scheme to subsidise the purchase of complementary health cover for slightly less poor people, whose income was up to 35% higher than the CMU-C ceiling. A total of 1.7 million individuals benefited from this in 2019.

3. This result is different for the sub-sample of individuals aged under 30, among whom those eligible for CMU-C have better access to specialists.

4. See Box later in article on the regulation of fees in excess of the agreed reimbursable rates in France.

Box – Regulation of Extra-Fees in France

In France, medical agreements set the prices for medical procedures, known as the statutory rates, which are used as the basis for the health cover provided by French Social Security. Physicians and dentists in private practice are paid a set fee per procedure, based on this rate.^(a) The 1980 agreement established two practice sectors: in Sector 1, physicians must charge the statutory rates^(b) whereas in Sector 2, referred to in French as *à honoraires libres*, physicians are free to set their own rates at a higher level than the statutory rate but with “tact and moderation”^(c), and the corresponding difference is known as extra-fees (sometimes referred to as the “balance bill”). In return for abandoning the practice of charging extra-fees, Sector 1 physicians benefit from part payment of their social security and pension contributions. There is no sector distinction for dentists, who can charge unregulated rates, equating to the freedom to charge extra-fees, but only on prosthetic procedures. Patients are covered by Health Insurance for 70% of the statutory rates for outpatient treatment. Out-of-pocket expenses (“beneficiary co-payments”, lump-sum contributions and extra-fees) may be partly or entirely covered by supplementary health insurance. In 2013, 95% of French people had supplementary health insurance, only 60% of whose policies provided even partial cover for extra-fees (Batto *et al.*, 2016). CMU-C is designed to prohibit extra-fees for Sector 2 physicians. With regard to prosthetic treatment, CMU-C imposes price caps, which are higher than the statutory rates and covered in full, on dentists.

Authorisation of extra-fees allows physicians to increase their income without any direct impact on Social Security expenditure. By assessing their patients' social situation during their first consultation, Sector 2 physicians and dentists are in a position to apply discriminatory rates, adjusting them according to their patients' willingness to pay (Johar *et al.*, 2014; 2017). But because they are not covered by Social Security, extra-fees may limit access to healthcare in departments of France where there are few Sector 1 physicians (Dormont & Péron, 2016). To contain their expansion in the context of primary healthcare, entry to Sector 2 was virtually frozen for GPs in 1990.^(d)

^(a) A small proportion of physicians' and dentists' fees comes from lump-sum payments. In our sample, they represent 6.3%, 1.1% and 0.2% respectively of remuneration for GPs, specialists and dentists.

^(b) Sector 1 physicians can charge extra-fees in certain special cases: classed as an extraordinary excess (a particular patient requirement) or authorised excess (if the patient has not followed the officially approved care pathway).

^(c) Article R.4127-53 of the French Code of Medical Ethics.

^(d) In practical terms, entry to Sector 2 was reserved for former clinical directors, which effectively excluded GPs. More recently, the Contrat d'Accès aux Soins (CAS) and Option Pratique Tarifaire Maîtrisée (Controlled rates option) were introduced (in 2014 and 2017 respectively) to encourage Sector 2 physicians, primarily specialists, to limit their extra-fees and increase the proportion of their practice that is subject to statutory rates.

d'Assurance Maladie (CNAM, the national health insurance fund) on the activity of health professionals in private practice, and the other from the *Direction Générale des Finances Publiques* (DGFIP, the French tax authority). These longitudinal data consist of four waves (2005, 2008, 2011 and 2014) and are exhaustive in their coverage of French health professionals in private practice who are subject to agreements with the state. The empirical strategy consists in estimating the impact of a variation in the proportion of their CMU-C patients on the fee components and activity of physicians and dentists. Each estimation takes into account the characteristics of the local population and medical density in the physician's geographical area by using INSEE census data. The sample is broken down according to the classification of specialist areas of medical training: general practitioners, medical specialists, radiologists, surgical specialists, paediatricians, psychiatrists, gynaecologists, anaesthetists and dentists. In total, the data include 389,776 observations relating to 142,877 physicians and dentists working full time in private practice, observed in 2005, 2008, 2011 and 2014.⁵

These longitudinal data allow us to specify fixed effect models to take account of unobserved characteristics relating to the physician, which remain constant over time and which might

be correlated with their behaviour as regards accepting CMU-C patients (ethical code, style of practice, etc.). In this context, estimations using the ordinary least squares method in a fixed effect model are convergent if the temporal variations in the proportion of the physician's CMU-C patients are exogenous, in other words if they correspond to fluctuations in the CMU-C demand made of the physician.

Conversely, if variations in the proportion of CMU-C patients are dependent on the physician's behaviour, it is necessary to implement an instrumental variable method to obtain a convergent estimation. Due to statistical power considerations, such an estimation was only possible for a less detailed categorisation of physicians, into just three groups, namely: GPs, specialists and dentists. The instrument used is the proportion of individuals with CMU-C cover in the department of France where the physician is based.⁶ While there may be a correlation with a specific physician effect connected with their choice of location when setting up in practice, the inclusion of fixed effects eliminates this source of bias. Our instrumental variable estimations allow us to reinforce the key results for the three main groups of physicians, obtained by fixed-effect

5. Dentists were observed only as from the 2008 wave.

6. These data have been provided by the CMU-C fund.

ordinary least squares using a more detailed categorisation of medical specialisations.

Our estimations show that the ban on extra-fees for CMU-C patients is associated with a significant drop in the average value of extra-fees per procedure when physicians see more CMU-C patients. The possibility of cost-shifting (i.e. charging other patients higher extra-fees) is therefore limited. However, this rate restriction does not lead to a significant reduction in total fees for GPs, dentists or any specialists except surgical specialists.⁷ It is noted that dentists and physicians able to charge unregulated fees increase their volume of activity when the proportion of their CMU-C patients increases. Using Sector 1 physicians (who cannot charge any extra-fees, see Box) as counterfactual to measure the potentially greater healthcare needs of CMU-C patients, the rise in volume of activity is suggestive of induced demand behaviour by Sector 2 specialists and GPs. This assumption is verified for GPs but not for specialists after we allow for the fact that the effect of work time constraints on physicians' ability to increase the number of procedures might differ by sector. For GPs and specialists as a whole as well as dentists, the instrumental variable estimates confirm the fall in extra-fees per procedure when the proportion of CMU-C patients increases, as well as the increase in number of procedures per patient and the absence of any impact on total fees.⁸

The rest of this paper firstly summarises the economic literature on analysing healthcare supply behaviour (Section 1), before presenting the data used and statistics describing the activity, fees and patient base of physicians and dentists in private practice (Section 2). Sections 3 and 4 present the empirical strategy and the results obtained, before providing conclusions in the final section.

1. Economic Analysis of Healthcare Supply and Pricing

The economic literature on the questions with which we are dealing relates to three main themes: the quality of healthcare offered when the physician is free to set their own prices; the impact of regulatory price constraints on the physician's decisions and lastly, the effect of price restrictions just for a certain proportion of patients, which directly corresponds to the issue of treating CMU-C patients.

Theoretical analysis of healthcare supply generally regards prices as being unregulated and assumes physicians to be practising in

monopolistic competition, with differentiating elements related to their individual location and reputation. They determine the price, quantity and quality of the healthcare they offer, by maximising their utility under the constraint of the demand addressed to them. In order to get the consumers surplus, they may play with prices and care quality, for example by adjusting consultation length (Glazer & McGuire, 1993; Clerc *et al.*, 2012). On the assumption that an improvement in care quality benefits all patients, price discrimination in the form of extra-fees may increase social well-being: the gains generated by the rise in care quality for all outweigh the surplus losses caused by the rise in prices for patients paying extra-fees (Kifmann & Scheuer, 2011).

Empirical studies do not contradict these theoretical predictions. French physicians practising in Sector 2 have longer consultations than their counterparts in Sector 1 (Breuil-Genier & Goffette 2006 ; Clerc *et al.*, 2012) and a study of Australian data shows no difference in the quality of care offered by a single GP to patients charged different rates (Johar *et al.*, 2014). But situation complexity does not permit any general theoretical prediction: there is probably heterogeneity of price-quality elasticity in the supply and demand functions regarding the healthcare provided by different physicians, and there is nothing to preclude discrimination between patients in terms of quality.

The subject of the consequences of differences between patients in terms of regulated rates was developed in the USA with the introduction of the Medicare and Medicaid public health insurance programmes for the over 65s and low-income households, respectively. Medicaid is also granted on a means-tested basis to individuals with Medicare health cover; its role is highly comparable to that of CMU-C in providing free supplementary cover for beneficiary co-payments, which are significant in Medicare, just as they are for Social Security in France (Dormont, 2019). In order to curb the cost of these public health cover programmes, the rates set for a Medicaid patient are lower than for a Medicare patient, which are in turn lower than for a patient with private insurance. Many studies show that these differences encourage inequality in terms of access to healthcare, finding that

7. The result regarding surgical specialists is not robust to the use of a first difference specification or to the inclusion or exclusion of 2014.

8. For dentists, a significant rise in total fees and average revenue per patient is obtained when the proportion of their patients with CMU-C health cover increases, but these results are not always robust.

an increase in Medicaid rates improves all aspects of treatment of individuals covered by Medicaid, including the length of consultation and similarly, that a fall in Medicaid rates leads to a deterioration in their treatment (Sloan *et al.*, 1978 ; Adams, 1994 ; Decker, 2007 ; Buchmueller *et al.*, 2015 ; Polsky *et al.*, 2015 ; Candon *et al.*, 2018 ; Alexander & Schnell, 2019). Conversely, the restrictions imposed in the 1980s on “balance billing” (the equivalent of extra-fees) for people with Medicare cover did not affect their use of healthcare services nor the quality of care (McKnight, 2007).

The incentive to refuse to treat patients affected by a reduced rate might be neutralised if physicians could compensate for this constraint by charging their other patients higher rates. In the literature, this strategy is termed cost-shifting. It is only optimal for the physician under certain conditions relating to the form of the demand function for their services, notably relatively low price-elasticity in regard to patients who are subject to extra-fees (Ginsburg, 2003). There are few empirical studies that examine this issue for physicians in private practice: we only found Showalter’s (1997) paper on American data, which shows no significant impact from a cut in Medicaid rates on the rates that local GPs charge patients with private insurance. In general, the impact of an increase in the number of patients subject to the reduced rate should lead the physician to a new optimisation calculation (according to the *homo economicus* model) which may lead them to alter the quantity of treatment offered, the amount of extra-fees (or balance bill), and the length of consultation (which determines their working time for a given level of activity). Their decisions in this respect will be dependent on their preferences in terms of work-leisure trade-off and their ethical code as a health professional.

Papers analysing physicians’ reactions to regulated-price shocks show adjustments where the income effect outweighs the substitution effect in terms of the trade-off between work and leisure. Coudin *et al.* (2015) study the impact of the Sector 2 freeze on GPs’ practices in France by means of a regression discontinuity method of analysis. They find that the volume of activity for physicians restricted by this freeze is 50% higher than for their peers in previous generations, who were not subject to consultation rate restrictions (for GPs affected by the reform, there was an average drop of 42%). A contingent valuation survey conducted by Chanel *et al.* (2017) among French GPs also shows that many of them claim an increase in the rates charged for treatment

would lead them to reduce their working time. In another context, Chen (2014) finds that a rise in Medicaid rates significantly reduced the total number of hours worked by American physicians. A rise in the level of activity of physicians must be interpreted with caution: it may correspond to a new economic balance if prices are unregulated and the rise in activity is in keeping with price elasticity of demand. It may also correspond to induced demand, that is to say an increase in the number of procedures per patient if the variation in practice activity is greater than would be predicted by price elasticity of demand or, in a fixed-price context, if demand for healthcare was previously being met (Delattre & Dormont, 2000).

2. Data on Physicians Covering All Areas of Specialisation and Sectors

2.1. Near-Exhaustive Data

Our data result from the matching of two administrative sources, namely the National health insurance fund (CNAM) and the Tax authority (DGFIP), which provide information for 2005, 2008, 2011 and 2014 on the activity of health professionals in private practice and their declared income. The matched data provide exhaustive coverage of physicians in private practice in Metropolitan France who are subject to agreements with the social security; all medical specialisations are observed, as well as dentists from 2008 onwards. The data are organised into an unbalanced panel, i.e. not all the physicians are present in all four waves, depending on when they set up in practice and when they retired.

The CNAM data concern the total fees received by the physician and distinguish between those derived from statutory rates and additional charges, extra-fees and lump-sum payments, as well as the volume of treatment provided by the physician, the number of clinical and technical procedures and prescriptions. The data also provide information about the physicians (age and gender, year of setting up in private practice, area of specialisation and practice sector) and about their total patient file (number of different patients seen in the year, practice structure by patient age and gender, proportion of patients with chronic conditions (ALD for *affection longue durée*) and patients with CMU-C health cover). In addition, we had access to information about the municipality in which the physician’s practice is based, enabling us to use INSEE census data to take into account the characteristics of the local population and medical density

in the physician's geographical area.⁹ The geographical level used is the "pseudo-canton"¹⁰, as municipalities are too small to include all movements of individuals and departments are too large to take into account the mixed picture in terms of supply and demand.

The study's coverage is limited to physicians and dentists subject to agreements with the social security, working full time in private practice in Sector 1 or 2 within Metropolitan France and aged 65 or less. Partially salaried physicians, who account for 16.6% of private practice physicians and dentists within this scope, for whom we have no information about their practice structure, are not taken into account. For the purposes of empirical analysis, we also excluded those physicians who changed sector or specialisation, and some atypical observations.¹¹ The final database consists of 389,776 observations corresponding to 142,877 physicians or dentists, which represent 93.5% of private practice physicians and dentists within the scope.

Specialisations are grouped together by specialist qualifications in the different areas of medical training: general medicine, paediatrics, psychiatry, medical specialisation, surgical specialisation, anaesthetics, gynaecology and radiology.¹² For dentists, the sub-group of those specialising in dentofacial orthopaedics, which accounts for 5.5% of dentists, is not included.

Working on the details of areas of specialisation, as we do, is rare, if not unique in econometrics applied to health data. Up until recently, French data on physicians stemmed from a survey of 1 in 10, without a sufficiently large sample size for each area of specialisation. Here, we study the details of the specialist areas, with a few exceptions.¹³ Our database is close to being exhaustive, consisting of: 62,398 general practitioners, 11,921 medical specialists, 5,595 radiologists, 10,106 surgical specialists, 4,077 psychiatrists, 3,739 gynaecologists, 2,028 paediatricians, 3,858 anaesthetists and 39,155 dentists.

The information available is nevertheless limited: we do not observe the physicians' practice at patient level or by patient category. The empirical approach therefore consists in assessing the average impact for each physician of a change in the annual proportion of their patients with CMU-C health cover in regard to their annual fees, extra-fees and practice volume, without being able to identify within these variables the proportions corresponding to CMU-C patients versus other patients.

2.2. Practice Volume and Total Patient File of Dentists and Physicians by Specialisation and Sector

An initial descriptive approach highlights quite marked differences by sector and area of specialisation (Table 1). Concerning the breakdown by sector, only 9.4% of GPs practise in Sector 2 because of greatly restricted access to this sector since 1990. This proportion is much higher but variable for specialists, from 68.2% for surgical specialists down to just 9.8% for radiologists. The number of patients also varies greatly from one type of practitioner to another: for example, GPs and paediatricians see about 1,500 different patients, for whom they carry out about 3 clinical procedures a year whereas psychiatrists have quite a low number of patients (about 400) whom they see 10 times a year and, conversely, gynaecologists, anaesthetists, and medical and surgical specialists have several thousand patients for whom they carry out about 1 clinical procedure and 1 technical procedure a year. Radiologists are a case apart: they see over 6,000 different patients in a year, for whom they carry out 2 technical procedures. Dentists see an average of 829 different patients for whom they carry out nearly 4 procedures a year, including 0.5 prosthetic procedures.

The proportion of patients with chronic conditions (ALD) is also characteristic of the medical specialists' practices: it is close to the national average (14.4% in 2011) for GPs but lower for paediatricians and gynaecologists (1.6% and 7.4% respectively for those in Sector 1), a proportion of whose patients do not necessarily have serious health issues (preventive monitoring or contraception). However, individuals with chronic conditions account for a much higher proportion of the patient base of medical specialists, surgical specialists, radiologists

9. As census data is unavailable for the 2005 wave, we use 2006 data instead.

10. A "pseudo-canton" is a grouping of one or more entire municipalities. There are 3,785 of them in Metropolitan France, made up of over 36,000 municipalities.

11. Sector 2 physicians and dentists with average excess fees per procedure of more than €100,000 or less than €1; physicians for whom the number of procedures carried out is smaller than the number of patients seen by them in the year, and observations for which at least one of the variables of interest has a negative or null value, or involving at least one missing variable in a given year. Stomatologists (0.7% of physicians subject to agreements with the state) who are surgical specialists have also been excluded from the analysis because the excess fees they charge their patients are high, even in Sector 1.

12. Although radiology forms part of the "medical specialisation" category, we assess radiologists separately because of the specific characteristics of their practice (see Table 1). The medical specialisation group primarily includes cardiology, dermatology, gastroenterology, rheumatology and pulmonology. Surgical specialist areas include ophthalmology, surgery and oto-rhino-laryngology.

13. Laboratory physicians, stomatologists and dentists specialising in dentofacial orthopaedics.

Table 1 – Patient base and practice structure – Averages per physician/year

	General Practitioners		Medical Specialists		Radiologists		Surgical Specialists		Psychiatrists		Gynaecologists		Paediatricians		Anaesthetists		Dentists
N. observations	189,631		34,208		14,307		26,409		10,971		10,347		5,447		9,437		89,019
N. physicians	62,398		11,921		5,595		10,106		4,077		3,739		2,028		3,858		39,155
% Sector 2	9.4		27.2		9.8		68.2		24.5		53.4		29.1		36.2		-
Sector	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	
N. patients	1713	1349	2620	2250	6619	6969	3614	2514	417	334	2396	2108	1571	1581	2686	2541	829
	(78)	(78)	(2923)	(3076)	(2950)	(3462)	(2302)	(2217)	(315)	(258)	(893)	(887)	(773)	(710)	(1042)	(1006)	(408)
Statistics per patient																	
Procedures	3.2	3.1	2.6	2.1	2.4	2.0	1.9	2.0	9.9	9.4	1.8	1.8	2.7	2.5	1.6	1.6	3.9
	(1.2)	(1.8)	(3.1)	(1.2)	(1.9)	(1.2)	(0.8)	(0.6)	(6.5)	(5.6)	(0.5)	(0.5)	(0.7)	(0.7)	(0.6)	(0.4)	(1.3)
Clinical	3.2	2.7	1.1	1.2	0.1	0.1	0.8	1.1	9.8	9.4	1.2	1.3	2.6	2.4	0.6	0.6	-
	(1.2)	(1.6)	(1.4)	(0.7)	(0.3)	(0.3)	(0.5)	(0.5)	(6.5)	(5.6)	(0.4)	(0.4)	(0.8)	(0.7)	(0.2)	(0.2)	
Technical	0.1	0.3	1.5	0.9	2.3	2.0	1.0	0.9	0.0	0.0	0.5	0.5	0.1	0.1	1.0	1.0	0.5*
	(0.5)	(1.1)	(2.6)	(1.1)	(1.7)	(1.0)	(0.9)	(0.6)	(0.1)	(0.1)	(0.5)	(0.5)	(0.2)	(0.2)	(0.6)	(0.3)	(0.4)
% Chronic condition	16.0	14.6	30.8	24.7	23.7	22.0	19.2	21.4	26.6	20.5	7.4	8.4	1.6	1.8	17.4	16.7	11.3
	(6.4)	(6.7)	(18.6)	(13.9)	(18.3)	(14.7)	(9.0)	(11.3)	(14.5)	(11.1)	(3.1)	(7.7)	(2.0)	(2.0)	(10.3)	(8.1)	(4.0)
% CMU-C	8.8	4.2	4.6	4.2	5.3	3.9	5.8	4.9	7.1	3.9	5.6	5.4	8.3	7.4	4.8	4.0	6.3
	(8.6)	(4.3)	(4.0)	(3.3)	(4.1)	(2.6)	(5.0)	(3.7)	(5.4)	(3.6)	(5.1)	(4.8)	(7.0)	(6.7)	(3.2)	(2.6)	(7.1)
%Zéro CMU-C	0.2	1.2	0.3	0.4	0.2	0.6	0.2	0.3	2.3	9.0	0.1	0.2	0.2	0.1	0.3	0.4	1.2

* Prosthetic procedures in the case of dentists.

Notes: Standard deviations are shown in brackets.

Reading Note: Sector 1 GPs have an average of 1,713 different patients in a given year.

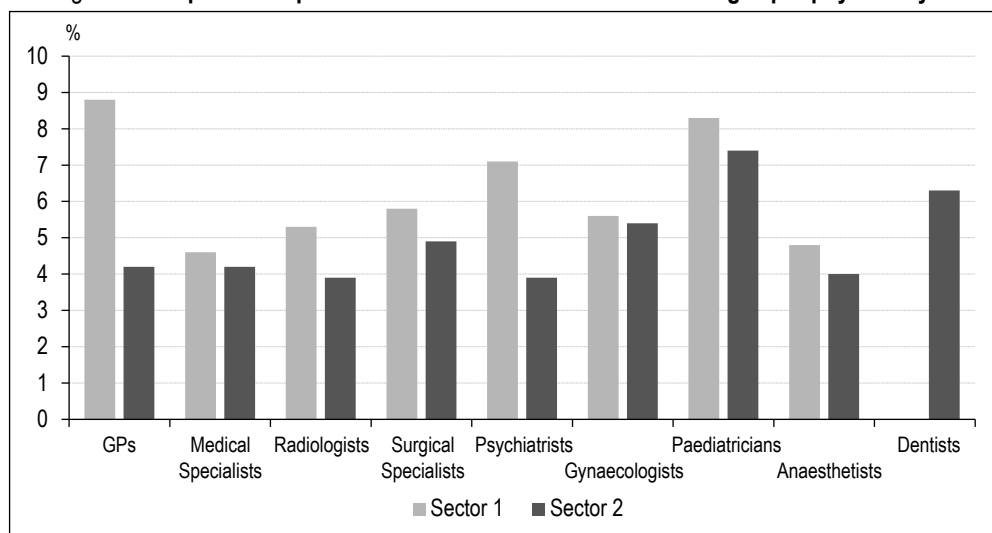
Sources and Coverage: CNAM-DGFIP matching, 2005-2008-2011-2014 waves. Metropolitan France. Physicians and dentists subject to agreements with the social security, aged 65 or less, and who work full time in private practice.

and psychiatrists compared with the national average.

Figure I illustrates physicians' treatment of patients with CMU-C health cover (detailed percentages in Table 1). The breakdown of patients with this cover by medical specialisation can be explained primarily by their specific needs. CMU-C patients are mainly children and young women, more often affected by

psychiatric problems than the other patients, which means that for GPs, psychiatrists and paediatricians, the proportion of those patients is higher than the national average for Metropolitan France (7.1% in 2014). Conversely, this proportion is lower for the other areas of specialisation. Above all, it is always lower in Sector 2 than in Sector 1. Without ruling out the hypothesis of more marked levels of refusal to treat in Sector 2, the geographical distribution

Figure I – Proportion of patients with CMU-C health cover – Averages per physician/year



Sources and Coverage: CNAM-DGFIP matching, 2005-2008-2011-2014 waves. Metropolitan France. Physicians and dentists subject to agreements with the social security, aged 65 or less, and who work full time in private practice.

of Sector 2 physicians and CMU-C patients in the region may explain these differences.

Very few physicians see no CMU-C patients at all, except for psychiatrists (9.0% in Sector 2 and 2.3% in Sector 1).¹⁴ Not treating any CMU-C patients may be the result of practice location.

In the period studied, the proportion of patients with CMU-C health cover first fell between 2005 and 2008, going from 6.3% to 5.8%, before then growing to 6.1% in 2011 and 7.1% in 2014. The significant increase between 2011 and 2014 can be explained by the 8.3% rise in the eligibility threshold for CMU-C in 2013 and by the effects of the 2008 financial crisis. In the sample, over half of physicians and dentists (61.6% of GPs, 60.5% of specialists and 50.6% of dentists) experience a reduction in the proportion of their CMU-C patients from one wave to the next. Compared with overall variations, this indicates a concentration of CMU-C activity (see Online Appendices, Table C1 – link at the end of the paper). Our specifications include a physician fixed effect, so it is the within standard deviation for this variable that measures the average significance of fluctuations in the proportion of known CMU-C patients for each physician: it appears to be fairly moderate, at about 1.5 points, and in excess of 2 points only in the case of Sector 1 psychiatrists.

2.3. Fees, Rates and Extra-fees for Dentists and Physicians by Specialisation and Sector

Sector 2 specialists charge higher fees than their Sector 1 counterparts (Table 2), whereas they have a lower volume of activity (see Table 1). In Sector 1, annual fees vary between €137,000 and €170,000 for GPs, paediatricians, psychiatrists and gynaecologists and are higher for other types of specialists, rising to €590,000 for radiologists. In Sector 2, extra-fees represent larger shares of total fees, ranging from 22.2% of fees for radiologists to 38.8% for psychiatrists. This suggests that Sector 2 physicians are dealing with a demand that is a decreasing function of extra-fees and that they charge higher rates, even if it means completing fewer procedures than their colleagues in Sector 1. In Sector 2, extra-fees per procedure vary between an average of €14 for GPs and radiologists to €42 for anaesthetists. Dentists, for whom unregulated pricing only applies to prosthetic procedures, charge average extra-fees of €309 per prosthetic procedure.¹⁵ These figures illustrate the effect of unregulated pricing: Dentists derive 48% of their total fees from extra-fees.

14. Physicians and dentists who do not see any CMU-C patients are distinctive: their fees are lower and they see fewer patients, for whom they carry out a higher number of very expensive procedures (see Online Appendices, Tables C11 and C12).

15. 99.4% of observations of dentists in our sample carry out a positive number of prosthetic procedures a year.

Table 2 – Fees and extra-fees – Averages per physician/year

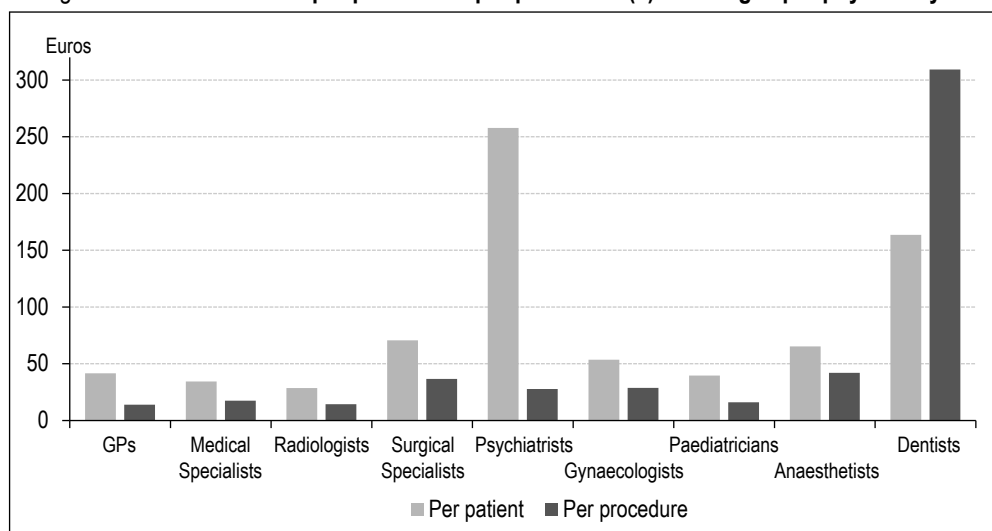
	General Practitioners		Medical Specialists		Radiologists		Surgical Specialists		Psychiatrists		Gynaecologists		Paediatricians		Anaesthetists		Dentists
N. observations	189,631		34,208		14,307		26,409		10,971		10,347		5,447		9,437		89,019
N. physicians	62,398		11,921		5,595		10,106		4,077		3,739		2,028		3,858		39,155
% Sector 2	9.4		27.2		9.8		6.8		24.5		53.4		29.1		36.2		-
Sector	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	
Fees																	
Annual (in €'000)	148	144	223	221	590	696	245	362	137	157	170	267	137	179	296	412	240
	(66)	(98)	(147)	(169)	(347)	(384)	(140)	(209)	(86)	(94)	(105)	(145)	(69)	(83)	(1096)	(147)	(135)
Per patient (in €)	926	123	121	122	138	132	99	207	409	619	72	137	90	117	126	180	3171
	(78)	(88)	(126)	(80)	(244)	(196)	(125)	(153)	(243)	(416)	(38)	(81)	(25)	(35)	(231)	(88)	(217)
Per procedure (in €)	29	42	49	60	51	59	51	104	43	66	39	72	34	47	80	116	415 ^(b)
	(71)	(27)	(29)	(29)	(47)	(30)	(68)	(75)	(6)	(17)	(13)	(31)	(7)	(10)	(213)	(50)	(125)
Extra-fees^(a)																	
Per patient (in €)	0.6	42	1	34	1	29	5	70.6	10	258	2.5	54	1	40	6.5	65	164
	(4)	(62)	(5)	(30)	(21)	(42)	(54)	(86)	(36)	(239)	(7)	(50)	(5)	(24.5)	(27)	(65)	(169)
Per procedure (in €)	0.2	14	0.5	18	0.4	14	3	37	1	28	1	29	0.5	16	4	42	309 ^(c)
	(1)	(26)	(2)	(15)	(6)	(14)	(36)	(47)	(3)	(17)	(3)	(22)	(1.8)	(10)	(17)	(40)	(122)
Per Fees (%)	0.6	30	1	29	0.7	22	2	31	2	39	3	38	1	32	4	32	48
	(3)	(15)	(3)	(14.5)	(3)	(13)	(6.5)	(14)	(5)	(13.9)	(6)	(13)	(4)	(12)	(9)	(15)	(11)

^(a) for dentists, this is more about freedom to charge unregulated rates for prosthetic procedures. ^(b) fees per prosthetic procedure. ^(c) excess fees per prosthetic procedure.

Reading Note: Total fees for Sector 1 GPs amount to an average of €148,000 in a given year.

Sources and Coverage: See Table 1.

Figure II – Total extra-fees per patient and per procedure (€) – Averages per physician/year



Notes: For dentists, this is more about freedom to charge unregulated rates, with the term "excess fees" being used in our study as the common term for both physicians and dentists. Excess fees per procedure equate to excess fees per prosthetic procedure for dentists.

Sources and Coverage: CNAM-DGFIP matching, 2005-2008-2011-2014 waves. Metropolitan France. Physicians in Sector 2 and dentists subject to agreements with the social security, aged 65 or less, and who work full time in private practice.

Average annual extra-fees per patient give an idea of the financial impact for a Sector 2 physician or dentist of treating a patient with CMU-C health cover: extra-fees range from €29 per patient for a radiologist to €258 for a psychiatrist (see Table 2 and Figure II). The opportunity cost is particularly high for a Sector 2 psychiatrist, owing to the large number of consultations held in a year for a single patient. This sheds light in particular on the results of the recently conducted field experiment mentioned earlier, which show a high incidence of discrimination among psychiatrists (Chareyron *et al.*, 2019).

3. Empirical Strategy

Empirical analysis of the impact of the rate restriction on the income and volume of activity for Sector 2 physicians and dentists is focused on three questions: Does an increase in the proportion of CMU-C patients lead to a reduction in the average extra-fees per procedure? Does it have a significant impact on the total fees received? Does it have a significant impact on the number of procedures provided per patient?

We adopt a reduced-form approach, estimating the impact of variation in the proportion of CMU-C patients on different variables of interest. Firstly, we assess whether Sector 2 physicians and dentists can completely absorb the rates shock associated with the ban on charging CMU-C patients extra-fees by compensating for the loss of earnings through higher extra-fees for their other patients. In principle, physicians should not have much latitude for such a strategy, as they are constrained by the

demand and can only increase extra-fees at the risk of losing patients. We then analyse the change in annual fees and volume of activity, broken down by number of patients and number of procedures per patient when the proportion of patients with CMU-C health cover increases.

The chosen specification is a fixed effect model in the following form:

$$y_{itc} = \%CMUC_{itc} \beta + X'_{itc} \delta + D'_{itc} \gamma + \lambda_t + \phi_i + e_{itc} \quad (1)$$

$$i = 1 \dots N; t = 2005, 2008, 2011, 2014;$$

$$c = 1, \dots, 3785$$

where y_{itc} represents the explained variable for physician i in pseudo-canton c in wave t : the logarithm for fees, average extra-fees per patient, average extra-fees per procedure, average number of procedures per patient and number of patients. The variable $\%CMUC_{itc}$ corresponds to the proportion of their CMU-C patients, expressed in percentage points (0-100). Vector X'_{itc} includes the total patient file variables (proportion of patients with chronic conditions and the age structure of their patient file) which influence the physician's practice behaviour and prices. Vector D'_{itc} contains variables regarding the physician's competitive context and local demand (in the pseudo-canton where they are established): population structure by age and gender, unemployment rate, and density of dentists or physicians for the area of specialisation under consideration.¹⁶

16. Medical density equates to the number of dentists or specialised physicians in private practice in Sector 1 or 2 per 100,000 inhabitants in the pseudo-canton concerned.

Time dummies λ_t take account of time impacts affecting all physicians identically in year t (technological advances, ageing of the population, economic climate, epidemics, etc.). The specific effect φ_i formalises the heterogeneity due to unobserved characteristics of the physician, which are assumed to remain constant, such as their ethical code, practice style and the preferences that steered them in their choice of location. Effects φ_i are assumed to be fixed and non-random, as this heterogeneity is probably correlated with the variables characterising the local context as regards medical density and demand for healthcare.¹⁷ Lastly, e_{it} is the idiosyncratic error term. Models are always estimated by allowing clusters to take account of possible correlations between disturbances for a single physician.

Estimating (1) by ordinary least squares leads to a convergent estimate if there is no correlation between the explanatory variables and the error term e_{it} . This assumption is perhaps not verified as regards the proportion of CMU-C patients. Introducing fixed effects helps to eliminate bias related to a level of discrimination that remains constant over time, but not a one-off refusal to treat in a given year when faced with a new request for a consultation from an individual with CMU-C health cover. Assuming variable $\%CMUC_{it}$ to be exogenous amounts to assuming that fluctuations in said variable reflect fluctuations in the demand addressed to physicians by individuals with said cover, with one of the possible modalities being that all physicians accept all CMU-C patients who apply to them. The estimates obtained in this context must be regarded as descriptive, as the assumed exogeneity of $\%CMUC_{it}$ does not allow any causal interpretation.

To confirm the interpretations of the results obtained within this context, we use an instrumental variable to correct for the bias that may result from a possible correlation between e_{it} and $\%CMUC_{it}$. The instrument used is the proportion of individuals with CMU-C cover in the department of France where the physician is based. While there may be a correlation with a specific physician effect connected with their choice of location when setting up in practice, the fixed effects eliminate this source of bias. Due to statistical power considerations, the instrumental variable estimate could only be applied to a broader categorisation of physicians by area of specialisation, namely distinguishing only between GPs, specialists and dentists. Hausman tests are conducted to test the exogeneity of variable $\%CMUC_{it}$.

Regardless of the explained variable, coefficient β measures the impact on this variable of the variation in the proportion of CMU-C patients. With regard to extra-fees per procedure, it should be noted that we cannot differentiate procedures or extra-fees between patient category, whether CMU-C or not, and that our variable measures average extra-fees per procedure, as calculated for the entire patient base. In this context, we can only test whether the physicians manage to compensate in full for the financial loss related to the ban on extra-fees for CMU-C patients by charging their other patients higher rates: the assumption tested is $\beta = 0$.

As people with CMU-C health cover may have greater healthcare needs than other patients, it is hard to identify whether extra activity by a physician with a higher proportion of CMU-C patients is due to a strategic reaction to the ban on charging extra-fees or simply in response to a higher demand for healthcare. To examine this point, our empirical approach consists of identifying the healthcare needs of the CMU-C population based on the results for Sector 1 physicians, who in theory are confronted with these needs in the same way as Sector 2 physicians, and then pinpointing the consequences of the financial constraint based on the contrast between the Sector 1 and Sector 2 assessments, all else being equal. This approach, which uses Sector 1 physicians as a counterfactual, is based on the assumption that individuals with CMU-C cover who consult Sector 1 physicians have identical healthcare needs to those who consult Sector 2 physicians.

We then consider specifications similar to (1), except that physicians from Sectors 1 and 2 are now pooled and we assume that all of the model's parameters may differ depending on the sector to which a physician belongs:

$$y_{itc} = \%CMUC_{itc} \beta_s + X'_{itc} \delta_s + D'_{itc} \gamma_s + \lambda_{t,s} + \varphi_i + e_{itc} \quad (2)$$

$$i = 1 \dots N; t = 2005, 2008, 2011, 2014; \\ c = 1, \dots, 3785; s = 1, 2$$

where $s = 1$ or 2 depending on the sector in which the physician practises.

The existence of contrasts between the reactions of physicians from the two sectors to a variation in the proportion of CMU-C patients will be tested using the null hypothesis test $H_0 : \beta_1 = \beta_2$.

17. For each explained variable, Hausman tests confirmed the rejection of the assumption of a lack of correlation of explanatory variables with specific physician effect with first-order risk $p < 1\%$.

If treating CMU-C patients is associated with a reduction in average extra-fees per procedure for Sector 2 physicians, we should get $\beta_2 < 0$. On the other hand, average fees per procedure for Sector 1 physicians should not be affected by a variation in the proportion of patients with CMU-C cover, as these physicians are not allowed to charge extra-fees. Examining whether $\beta_1 = 0$ therefore constitutes a placebo test to validate the empirical approach.

The effects on the number of procedures per patient and on the number of patients allow us to analyse whether there is a link between treating patients with CMU-C health cover and effects on volume of activity. These volume effects may lead to increases in fees for Sector 1 physicians and compensate for potential price-related losses for those in Sector 2. If individuals with CMU-C cover have identical healthcare needs, regardless of the practice sector of the physician whom they consult, then a significantly higher increase in the number of procedures per patient among Sector 2 physicians compared with those in Sector 1 ($\beta_2 > \beta_1$) may signal induced demand behaviour by Sector 2 physicians to compensate for the loss suffered in terms of fees per procedure stemming from treatment of CMU-C patients.

4. Results

Firstly, the results show that an increase in the proportion of CMU-C patients does not lead to significantly lower total fees for physicians and dentists, except for surgical specialists.¹⁸ But behind this non-significant impact, our estimates reveal considerable price and volume effects.

4.1. Do Sector 2 Physicians and Dentists Compensate for the Absence of Extra-fees for CMU-C Patients by Charging Other Patients Higher Rates?

The assumption that the financial impact is eliminated by means of cost-shifting is rejected. It can, indeed, be observed that, all else being equal, an increase in the proportion of CMU-C patients leads to a significant reduction in the average extra-fee per procedure for all physicians and dentists (Table 3, column 3). The scale of the effects varies by area of specialisation: when the proportion of CMU-C patients rises by 1 percentage point,¹⁹ extra-fees per procedure

18. The result with regard to surgical specialists is not robust (see below for details of robustness testing).

19. It should be noted that the within standard deviation for the proportion of patients with CMU-C health cover is about 1.5 points for most areas of specialisation in Sector 2.

Table 3 – Impact of a variation in the proportion of patients with CMU-C health cover for Sector 2 physicians and dentists in private practice – Physician fixed effect models

Explained Variable	Ln(Fees) (1)	Ln(Extra-fees ^(a))		Ln(Procedures per Patient) (4)	Ln(Patients) (5)	N. obs
		per Patient) (2)	per Procedure) (3)			
General practioners	-0.0031 (0.0019)	-0.0124*** (0.0020)	-0.0154*** (0.0019)	0.0030** (0.0013)	-0.0017 (0.0017)	18,089
All specialists	-0.0039 (0.0029)	-0.0179*** (0.0022)	-0.0212*** (0.0022)	0.0032*** (0.0011)	-0.0004 (0.0026)	39,051
Medical specialists	-0.0086 (0.0060)	-0.0182*** (0.0033)	-0.0246*** (0.0036)	0.0063*** (0.0016)	-0.0091* (0.0055)	8,648
Radiologists	0.0645 (0.0440)	-0.0532** (0.0220)	-0.0605** (0.0261)	0.0072 (0.0082)	0.0775 (0.0493)	1,170
Surgical specialists	-0.0082** (0.0038)	-0.0132*** (0.0034)	-0.0149*** (0.0037)	0.0017 (0.0015)	-0.0047 (0.0034)	17,225
Psychiatrists	0.0087 (0.0102)	-0.0218*** (0.0078)	-0.0256*** (0.0069)	0.0038 (0.0053)	0.0132 (0.0088)	2,322
Gynaecologists	-0.0106 (0.0081)	-0.0180*** (0.0037)	-0.0187*** (0.0036)	0.0006 (0.0018)	-0.0090 (0.0072)	5,080
Paediatricians	-0.0079 (0.0088)	-0.0202*** (0.0056)	-0.0181*** (0.0049)	-0.0021 (0.0031)	-0.0040 (0.0077)	1,430
Anaesthetists	0.0186 (0.0144)	-0.0328*** (0.0099)	-0.0376*** (0.0095)	0.0048 (0.0047)	0.0286** (0.0133)	3,176
Dentists	-0.0006 (0.0013)	-0.0065*** (0.0009)	-0.0085*** ^(b) (0.0004)	0.0044*** (0.0004)	0.0005 (0.0010)	89,019

^(a) for dentists, this is more about freedom to charge unregulated rates for prosthetic procedures. ^(b) excess fees per prosthetic procedure logarithm. Notes: p < 0.1 *; p < 0.05 **; p < 0.01 ***. Estimations include physicians fixed effects and are made controlling: year of observation; age structure of the patient base; proportion of patients with chronic conditions; physician density for the category in question in the pseudo-canton; age and gender structure of the population in the pseudo-canton, and unemployment rate in the pseudo-canton. Standard deviations in brackets allow clusters at physician level.

Reading Note: A rise by 1 percentage point in the proportion of patients with CMU-C health cover significantly reduces the average excess fees per procedure for Sector 2 GPs by 1.5% (with a first-order risk of 1%).

Sources and Coverage: See Table 1.

are observed to fall by about 2% for GPs and most specialists, 4% for anaesthetists and 6% for radiologists. For dentists, there is a 0.9% fall in extra-fees per prosthetic procedure.

These results show that Sector 2 physicians and dentists cannot fully compensate for the restriction on extra-fees by increasing their rates for other patients. The results are similar to those obtained by Showalter (1997), who did not find cost-shifting when analysing American data. Our results are compatible with a strategy of increasing extra-fees for non-CMU-C patients, but one that would only achieve partial compensation; they may also mean that physicians reduce their extra-fees to attract more patients and make up for their loss of earnings by increasing the number of procedures carried out.

The results also indicate that a rise in the proportion of CMU-C patients entails a rise in the number of procedures per patient (Table 3, column 4), an effect that is significant for GPs (+0.3%), medical specialists (+0.6%) and dentists (+0.4%). This rise in the number of procedures per patient does not allow any area of specialisation to avoid a fall in extra-fees per patient (Table 3, column 2). Lastly, it can be observed that the fall in extra-fees per procedure is not compensated for by a rise in the number of patients (except for anaesthetists), as this remains constant for almost all areas of specialisation (column 5). The variation in the proportion of CMU-C patients is a substitution with patient numbers remaining constant.²⁰

4.2. Impact of Limiting Extra-fees: Volume Effects

Table 4 shows the estimates from the model (2): the β_1 coefficients estimated for Sector 1 physicians (S1), β_2 estimated for Sector 2 physicians (S2) and the significance level for the contrast between the two sectors ($S1 = S2$).

The results confirm the previous interpretations for GPs and medical specialists: significant negative effects can be observed on Sector 2 physicians but not on those in Sector 1;²¹ it is indeed the ban on extra-fees for CMU-C patients that leads to the reduction in fees per procedure.

As we saw above, maintaining the total amount of fees despite the restriction related to the ban on extra-fees is accompanied by an increased volume of activity for Sector 2 physicians, as is shown by the significant positive effects on the number of procedures per patient or number of patients (Table 4, columns 3 and 4). For Sector 2

GPs and medical specialists, it clearly appears that when the proportion of CMU-C patients increases, the fees per procedure fall, the number of procedures per patient increases and the overall total amount of fees is not affected.

Are these volume effects connected with CMU-C patients' greater healthcare needs or with induced demand behaviour on the part of the Sector 2 physicians to compensate for price-related losses? Assuming that needs are fully accounted for through the estimated impacts in Sector 1, we examine the significance level for the contrast $\beta_1 - \beta_2$ in the number of procedures per patient between physicians in Sector 1 and Sector 2 (Table 4, column 3, line S1=S2). We find a significant contrast for GPs and specialists as a whole. For example, when GPs experience a 1 percentage point rise in the proportion of their patients with CMU-C cover, the number of procedures per patient in Sector 2 increases by 0.3%, whereas it falls by 0.1% in Sector 1.

Before interpreting this contrast as the expression of induced demand behaviour, it is necessary to verify that there is no constraint due to saturation point being reached as regards working hours, which might affect GPs and specialists differently depending on their practice sector. To examine this point, we carry out the same estimations for areas of specialisation suspected of induced demand but only retain in the sample those physicians who, in theory, are not already at saturation point as their level of activity is low or moderate, that is to say within the first three quartiles of the distribution of total number of procedures, regardless of sector. The results confirm the induced demand hypothesis for GPs but not for specialists as a whole (see Online Appendix, Table C2).

These results do not allow any causal relations to be established as they are based on the assumption that variations in the proportion of a physician's CMU-C patients are exogenous. We therefore estimate the fixed effect model using, as an instrument, the proportion of individuals with CMU-C health cover in the department

20. Additional analyses, not shown here, indicate that an increase in the proportion of patients with CMU-C health cover is accompanied by a fall in the proportion of fees accounted for by lump-sum payments for Sector 2 GPs and that there is no correlation with the proportion of fees represented by lump-sum payments for Sector 2 specialists and dentists.

21. This is not the case for psychiatrists and anaesthetists in Sector 1, who also suffer a reduction in their fees per procedure. This effect may be explained by the approved excess fees that Sector 1 physicians are entitled to charge if the patient does not follow the officially approved care pathway, but not for CMU-C patients. Table 2 shows that among Sector 1 physicians, psychiatrists and anaesthetists charge higher excess fees per patient than other specialists.

Table 4 – Impact of a variation in the proportion of patients with CMU-C health cover for physicians in private practice – Physician fixed effect models

Explained variables		Ln(Fees) (1)	Ln(Fees / procedure) (2)	Ln(Procedures / patient) (3)	Ln(Patients) (4)	N Obs.
General practioners	S1	0.0030*** (0.0009)	0.0003 (0.0002)	-0.0013*** (0.0004)	0.0041*** (0.0008)	189,631
	S2	-0.0031 (0.0019)	-0.0044*** (0.0006)	0.0030** (0.0013)	-0.0017 (0.0017)	
	S1 = S2	***	***	***	***	
All specialists	S1	0.0052* (0.0027)	0.0003 (0.0005)	-0.0003 (0.0008)	0.0052** (0.0025)	111,126
	S2	-0.0038 (0.0029)	-0.0066*** (0.0009)	0.0032*** (0.0011)	-0.0004 (0.0026)	
	S1 = S2	**	***	**	ns	
Medical specialists	S1	-0.0001 (0.0051)	-0.0006 (0.0007)	0.0045*** (0.0013)	-0.0040 (0.0048)	34,208
	S2	-0.0086 (0.0060)	-0.0058*** (0.0012)	0.0063*** (0.0016)	-0.0091* (0.0055)	
	S1 = S2	ns	***	ns	ns	
Radiologists	S1	0.0182* (0.0102)	0.0037** (0.0017)	-0.0015 (0.0022)	0.0160* (0.0095)	14,307
	S2	0.0645 (0.0438)	-0.0203* (0.0123)	0.0072 (0.0082)	0.0775 (0.0491)	
	S1 = S2	ns	*	ns	ns	
Surgical specialists	S1	-0.0056 (0.0096)	0.0070*** (0.0019)	-0.0025 (0.0021)	-0.0102 (0.0082)	26,409
	S2	-0.0081** (0.0038)	-0.0051*** (0.0017)	0.0017 (0.0015)	-0.0047 (0.0034)	
	S1 = S2	ns	***	ns	ns	
Psychiatrists	S1	0.0031 (0.0034)	-0.0025*** (0.0004)	0.0001 (0.0019)	0.0056** (0.0025)	10,971
	S2	0.0086 (0.0101)	-0.0083*** (0.0020)	0.0038 (0.0053)	0.0132 (0.0087)	
	S1 = S2	ns	***	ns	ns	
Gynaecologists	S1	-0.0052 (0.0039)	-0.0003 (0.0013)	0.0041*** (0.0015)	-0.0090*** (0.0032)	10,347
	S2	-0.0106 (0.0080)	-0.0021 (0.0017)	0.0006 (0.0018)	-0.0090 (0.0072)	
	S1 = S2	ns	ns	ns	ns	
Pediatricians	S1	0.0087 (0.0057)	0.0002 (0.0006)	0.0032 (0.0019)	0.0052 (0.0045)	5,447
	S2	-0.0079 (0.0087)	-0.0018 (0.0012)	-0.0021 (0.0031)	-0.0040 (0.0077)	
	S1 = S2	ns	ns	ns	ns	
Anaesthetists	S1	0.0077 (0.0238)	-0.0072* (0.0040)	-0.0045** (0.0020)	0.0194 (0.0250)	9,437
	S2	0.0186 (0.0144)	-0.0149*** (0.0056)	0.0048 (0.0047)	0.0286** (0.0133)	
	S1 = S2	ns	ns	*	ns	

Notes: ns for non-significant; $p < 0.1$ *; $p < 0.05$ **; $p < 0.01$ ***. Estimations include physicians fixed effects and are made controlling the same variables as indicated in the Notes for Table 3 and allowing their heterogeneous effects for physicians in Sector 1 and Sector 2. Standard deviations in brackets allow clusters at physician level.

Reading Note: A rise by 1 percentage point in the proportion of patients with CMU-C health cover significantly increases Sector 1 GPs' total fees by 0.3% (with a first-order risk of 1%). This effect is significantly different for GPs from Sector 1 versus those practising in Sector 2, with a first-order risk of 1%.

Sources and Coverage: See Table 1.

where the physician practices; as indicated above, due to statistical power considerations, this can only be done using a broader categorisation, which groups together all specialists. The results are shown in Table 5. The Fisher

test (column 2) shows the instrument correlates well with $\%CMUC_{itc}$. Adopting a null hypothesis rejection threshold of 5% regarding the exogeneity of the variable $\%CMUC_{itc}$, our conclusions remain unchanged for the three broad categories:

Table 5 – Impact of a variation in the proportion of patients with CMU-C health cover for Sector 2 physicians and dentists in private practice – Physician fixed effect instrumental variable models

Explained Variable	Stage One		Stage Two					No. of obs
	% Patients CMU-C (1)	Fisher (2)	Ln (Fees) (3)	Ln(Excess Fees ^(a))		Ln(Procedures Per Patient) (6)	Ln(Patients) (7)	
				per Patient) (4)	per Procedure) (5)			
General Practitioners	0.499*** (0.042)	139	-0.0099 (0.0110)	-0.0491*** (0.0132)	-0.0588*** (0.0122)	0.0097 (0.0069)	-0.0068 (0.0106)	18 089
p-value			0.5269	0.0044	0.0002	0.3277	0.6258	
Specialists	0.488*** (0.027)	308	-0.0109 (0.0100)	-0.0495*** (0.0107)	-0.0587*** (0.0111)	0.0092 (0.0058)	0.0058 (0.0097)	39 051
p-value			0.4916	0.0025	0.0006	0.3031	0.5193	
Dentists	0.405*** (0.029)	190	0.0188** (0.0085)	0.0375*** (0.0085)	-0.0178*** ^(b) (0.0042)	0.0185*** (0.0041)	-0.0130* (0.0071)	89 019
p-value			0.0230	0.0000	0.0281	0.0005	0.0597	

^(a) for dentists, this is more about freedom to charge unregulated rates for prosthetic procedures. ^(b) excess fees per prosthetic procedure logarithm. Notes: p < 0.1 *; p < 0.05 **; p < 0.01 ***. The proportion of patients with CMU-C health cover is instrumented with the proportion of individuals with CMU-C cover in the department of France where the physician's practice is based. Estimations include physicians fixed effects and are made controlling the same variables as indicated in the Notes for Table 3. The p-value of the Hausman test indicates whether the variable for the proportion of patients with CMU-C cover can be treated as exogenous. Column 2 indicates the Fisher statistic for the instrument excluded in stage one. Reading Note: Column 1 shows that a rise by 1 percentage point in the proportion of individuals within the department with CMU-C health cover increases the proportion of Sector 2 GPs' patients who have CMU-C cover by 0.5 percentage points (with a first-order risk of 1%). Column 5 shows that a rise by 1 percentage point in the proportion of patients with CMU-C health cover significantly reduces the average excess fees per procedure for Sector 2 GPs by 5.9% (with a first-order risk of 1%). Sources and Coverage: See Table 1.

varying the proportion of CMU-C patients leads to a reduction in the average excess fee per procedure and per patient, with no overall impact on the total value of fees.

The instrumental variable estimates give an important result for dentists: an increase in the proportion of their CMU-C patients by 1 percentage point leads to a 3.8% rise in their extra-fees per patient²² (Table 5). This result must be confirmed, as it is not obtained in our robustness tests (first differences estimation). If it were to be confirmed, one might conclude that the 30% price rise for prosthetic procedures applicable to CMU-C patients in 2006 was precisely calibrated to avoid a negative impact on average revenue per patient for dentists in private practice treating CMU-C patients.²³

4.3. Robustness of Results

With first difference estimations, we obtain the same results, except for the estimated impact with the instrumental variable estimator regarding the rise in fees and extra-fees per patient for dentists (see Online Appendix, Tables C3 to C6).

Our results could be sensitive to various types of shocks. In particular, the impacts of public policies between 2012 and 2014, potentially affecting physicians differently, would not be controlled by time dummies. In 2012, the ban on extra-fees was extended to patients eligible for the ACS supplementary health insurance subsidy scheme, a rule that does not seem to have been entirely respected by physicians

up to 2015, according to Jusot *et al.* (2019). Moreover, in 2013, the raising of the CMU-C eligibility threshold led to a significant increase in the number of beneficiaries (+18%). Lastly, in 2014, physicians who signed the *Contrat d'Accès aux Soins* (an agreement between physicians and the social security to limit extra-fees) undertook to limit their average extra-fees rate to 100% of the statutory rate and to maintain their volume of activity carried out at the statutory rate. We ran our models excluding the 2014 wave in order to assess whether these three public policy-related impacts have a significant effect on the estimates. This proved not to be the case: apart from a few exceptions already mentioned above, our results are identical over the 2005-2011 period (see Online Appendix, Tables C7 to C10). Our results might then be sensitive to the impact of the physician's household composition: those whose family circumstances have changed might be inclined to refuse to treat CMU-C patients in a given year. We find the results withstand the inclusion in the regression of variables characterising the household (marital status and number of dependent children). Lastly, there might be local impacts on income, potentially leading to an increase in the rate of individuals entitled to CMU-C cover owing to a general fall in income in a particular department of

22. For dentists, this is rather freedom to charge unregulated rates, with the term "excess fees" being used in our study as the common term for both physicians and dentists.

23. The results in Table 5 also show for dentists that an increase in the proportion of their patients with CMU-C health cover by 1 percentage point leads to a 1.9 % rise in their total fees. This result is not robust for any of the robustness tests in the following section.

France, without this being captured by the “pseudo-canton” unemployment rate control variable. Such a correlation would entail a variation in physicians’ fees or in their volume of activity, unconnected with variations in the proportion of people entitled to CMU-C cover within the department. However, this seems unlikely, as our results are robust when we control for median income at the department level (median income is not available at pseudo-canton level).

* *
*

Sector 2 physicians and dentists do not manage to compensate for the ban on extra-fees for CMU-C patients by charging other patients higher rates, but this fall in rates does not entail a drop in total fees as physicians simultaneously increase their volume of activity. The rise in volume of activity may stem from induced demand behaviour or greater healthcare needs for CMU-C patients. By using Sector 1 physicians as counterfactual, we identify induced demand for Sector 2 specialists and GPs. However, the relevance of reference to Sector 1 may be questioned, based on the argument that some Sector 1 physicians may already have no capacity for more work. Eliminating physicians with a high level of activity results in the induced demand hypothesis being confirmed for Sector 2 GPs but no longer for Sector 2 specialists. As dentists do not belong to an officially agreed sector, there is no reference group to help interpret the rise in their activity in terms of induced demand. The instrumental variable estimations confirm our results. They can only be calculated using a broader categorisation of medical specialisations, but allow to account for the non-exogeneity of physicians’ behaviour as regards treating CMU-C patients. For dentists,

they also show that an increase in the proportion of CMU-C patients leads to a significant rise in the dentists’ revenue per patient, but this result must be confirmed as it is not always robust but may be connected with the price hike decided on in 2006 for prosthetic procedures applicable to patients with CMU-C health cover.

Our results suggest that the ban on extra-fees is not neutral for Sector 2 physicians and dentists, as treating patients with CMU-C health cover leads to a drop in the average price per procedure and an increase in the volume of activity. That might explain, more generally, incidences of refusal to treat for all physicians and, in particular, psychiatrists (who have an average of 10 consultations per patient a year). Interpreting our results in terms of the trade-off between work and leisure, they suggest that physicians’ preferences are such that the income effect outweighs the substitution effect: when procedure-related income falls, they react by carrying out more procedures, which is a result that tallies with those obtained by Coudin *et al.* (2015) and Chanel *et al.* (2017). However, since we are not able to observe the length of consultations, we cannot tell whether the rise in volume of activity involves increased working time.

From the perspective of public decision-making, the evident fall in average remuneration per procedure for Sector 2 physicians and dentists suggests that the ban on extra-fees might be a source of inefficiency on two counts: it may foster discrimination against patients with CMU-C health cover, and it may encourage induced demand behaviour. Some thought must inevitably be given to the current regulations, as the obligation to charge statutory rates has been extended to individuals eligible for ACS vouchers and subsequently maintained in the setting up of the new *Complémentaire Santé Solidaire* system in 2019. □

Link to Online Appendices: https://www.insee.fr/en/statistiques/5396132/ES-524-525_Dormont-Gayet_Online_appendix.pdf

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