French GPs' willingness to delegate tasks: when risk aversion meets financial incentives

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Abstract

Within hospital settings, delegation to paramedics is fairly recent in France. Whether General Practitioners are likely to follow hospital consultants is unknown. A 2012 survey of 2,000 GPs might help foresee GPs willingness to do so. This paper tests whether a more favourable funding system might help increasing GPs willingness. We implement a quasi-experimental design wherein GP's are randomly selected to form three groups of equal size, each of them being exposed to a different funding scheme when declaring their willingness to delegate tasks to nurses: fully funded (FF) by the social security administration, self-funded by GPs' revenues (Self Funded, SF) and half-funded by both the social security administration and GPs (Half Funded, HF).

GP's likelihood to be in favour of task delegation is estimated with a Probit model which especially considers GP's attitude toward risk (aversion or preference), among a set of covariates such as age, gender, rural/urban area, GP's density and funding scheme. This article shows that, firstly GPs are more likely to favour delegation where they share a lower proportion of the cost. Secondly, the effect of risk aversion on the likelihood of being in favour of delegation is not altered by the funding scheme.

JEL Codes : I12, I18, J33, M55.

Keywords : skill mix, task shifting, risk aversion, financial incentives

1. Introduction

In France, the decade 2000 was peppered with numerous public reports concerning the economic, legal and organizational feasibility of task shifting and cooperation between healthcare professionals (Berland, 2003; Berland & Bourgueil, 2006; HAS, 2008, 2010). All these reports or recommendations translated into the legal opportunity given to healthcare professionals to delegate some tasks or activities to medical auxiliaries. The law of the 21st of July 2009[1] allows health professionals to transfer activities between two professions[2]. A physician may delegate to a nurse some tasks that are usually performed by him or her.

Stated goals were the following: counteracting the announced decrease in physician density, favouring cooperation between healthcare professionals, enable paramedics to advance in their practice (a better recognition of these professions is at stake).

So far, this possibility has been used only at the hospital level as there is no agreement in ambulatory care on the funding of the scheme (Massin *et al.*, 2014). In France, task delegation in the general practice has only been the consequence of experimentations (for an example, see Mousquès *et al.*, 2010). Indeed, most of GPs are self-employed (Chevreul *et al.*, 2010), so this new contract would imply both the introduction of team practice for a majority of GPs (and, as a consequence, a need for coordination/cooperation) and the delegation of tasks for everyone, with a loss in GPs' earnings in the short run to be offset by a reallocation in GPs working time towards activities generating at least equivalent income in the long run.

Historically, GPs who have been playing the role of gatekeeper since 2004 are funded by a fee-for-service payment (either fixed or free fees depending on the conventional sector of practice). Fees in general practice are partially reimbursed to the insured by the National health insurance fund. Full coverage is possible, depending on the non-mandatory subscription of complementary health insurance[3]. Fees for specialized ambulatory care are higher and depend on the speciality. Referral to specialists care depends on prior GP's visit. Where a patient does not have a consultation with a GP beforehand, the out-of-pocket money is larger for patients because the reimbursement by the Health Insurance is far reduced. Of importance, self-employed medical auxiliaries' activity is directly dependent from GPs' prescription: it shapes the nature of the relationship between them.

[1]Article L. 4011- 1 of the Code of Public Health.

[2]Such a derogatory scheme may be established for professions for which the French National Authority for Health (HAS) has given an agreement for potential delegation (*Law n°2013-1203 of 23 December 2013 - Article 35*, n.d.). It is up to the professions to propose a scheme (*Code of Public Health - Article L4011-1*, n.d.) to the Regional Health Body (ARS). If the funding body (body set up by the ministry of health and the social security) accept the scheme (*Code of Public Health - Article L4011-2-1*, n.d.) then the ministry of health may authorise it (*Law n°2013-1203 of 23 December 2013 - Article 35*, n.d.). The scheme may not exceed three years and may be renewed once (*Code of Public Health - Article L4011-2-2*, n.d.).

[3]Five percent of the population is eligible for a full coverage by the National Health Insurance Fund based on revenues. Also, patients with long term disease are fully covered when their consultation regards their long term illness.

Moreover, the definition of a "business model" (*i.e.* financing plan and remuneration schemes for every tasks completed) is needed and required by the law when implementing this cooperation. As a result, the question whether economic incentives can foster an efficient coordination and cooperation between healthcare professionals is central. We know that the decision to delegate tasks depends both on economic and extra-economic factors. Notably, task-shifting involves a financial risk for GPs (as he/she gets rid of a part of its activity) and also a risk in terms of non-quality for patient.

Few empirical studies intend to tackle this issue. The most of them focussed on the outcomes of task-shifting and whether task-shifting is efficient (Buchan and Calman, 2005; Richards *et al.*, 2010*;* Mousques *et al.*, 2010). This literature evidenced that work organization and gaps in terms of consultation length, productivity and hourly wage are the main drivers of the efficacy or efficiency of task-shifting.

Our main objective is to identify the main economic and extra-economic determinants of GPs' willingness to delegate tasks to other healthcare professionals. More precisely, this paper intends to test whether implementing a funding system which takes into account GPs' risk aversion is likely to induce a better coordination between GPs and medical auxiliaries (such as nurses or masseur-physiotherapists) by promoting task-shifting. In this context, financial incentives would be considered as an instrument allowing to alleviate the uncertainty of the delegation decision.
We find that the less relevant are the cost-sharing mechanism, the more GPs self-declare their willingness to delegate tasks to medical auxiliaries.

The reminder of the paper is organized as follows. Section 2 presents the theoretical and empirical literature related to our research question. Sections 3 and 4 respectively deal with data and empirical strategy. Section 5 and 6 are dedicated to results and some elements of discussion.

2. Literature review

.2.1. Theoretical background

Most of economists propose that incentives should be fine tuned for agents to behave efficiently. Where efficiency meets coordination, some instruments aiming for agents to coordinate should be used: beside law, contract or hierarchy, financial incentives are one of these. Some research papers have shown that financial incentives might be working in this setting (Prendergast, 1999, 2002; Robinson, 2001). To sum up this wide literature, main issues are the following. First of all, attention has to be paid to the trade-off between financial risk and economic incentives when implementing cost-sharing mechanisms. Then, in the context of multi-tasking, whether contracts should be complete or incomplete is of relevance. In the literature concerning team production, collective payments are regarded as efficient instruments to improve global performance. Finally, to ensure the stability and the efficacy of the cooperation, the allocation of responsibilities is fundamental: partners must determine who is/are residual claimant(s).

A usual framework to study the decision of delegation is the principal-agent model, where asymmetries of information tend to make difficult the coordination between the principal and the agent. This framework is quite operational to analyze task shifting between health professionals and, in our setting, GP is the principal and nurse is the agent. Additional to some other factors such as discrepancies in consultation length, productivity and hourly wage or work organization (Midy, 2003), task delegation is a decision which, like a wide range of economic behaviours, can be regarded as depending on psychological motives such as risk attitudes (Dohmen *et al.*, 2011) and/or intrinsic motivations (Frey, 1997). Traditionally, theoretical models interested in task delegation issue in a context of information asymmetry look at the behaviour of a risk-neutral principal who transfers to a risk averse agent tasks that he cannot perform by himself. Financial incentives are used to make the agent doing the task in the right way by counterbalancing the moral hazard problem. In this paper, we consider a different case where a risk-averse principal has to choose whether she delegates some tasks she is able to perform by herself to an agent whose efforts are not observable.

.2.2. Empirical results

At the international level, skill-mix and task shifting between health professionals is an issue that rose a long time ago. The 1978 Alma Ata World Health Organisation conference led to recommendations of which were the appropriate use of skills of all health professionals (International Conference on Primary Health Care, 1978). In 1980, a study was led in the UK (Miller and Backett, 1980) which investigated the characteristics of GPs favouring delegation of tasks and potential use of a nurse practitioner. Back then, this arrangement was supposed to free GPs of tasks that can be performed by nurses.
In the UK, a new GP contract was negotiated in 1990 and a review of the literature by Richards et al. (2000) showed that the GPs attitudes changed before and after the implementation of the new contract. GPs tended to be more fearful before and more willing after the new contract. With this new contract, nursing roles expanded to “travel advice, ECG recordings, suturing, the management of diabetic patients, anxiety and depression management and advice on common illnesses.” (Richards *et al.*, 2000, p. 190).

Most of the research into staff-mix has focused on the impact of staff-mix on the delivery of care and patient outcomes (McGillis Hall, 1997; Cavanagh and Bamford, 1997; Spilsbury, 2001; Buchan and Dal Poz, 2002; Aiken et al., 2003; Sibbald *et al.*, 2004; Lee et al., 2005). Some research has also focused on the economic impact of changing staff-mix. It appears to have established that, in a few settings, substituting doctors for less qualified ones may improve patient satisfaction with no adverse impact on patients outcomes (Midy, 2003, Buchan and Calman, 2005; Laurant *et al.*, 2005).

Task shifting is advocated everywhere shortages in health professionals’ services have been experienced (WHO, 2006; Samb, 2007). Delegation of work from GPs to other health professionals other than physicians is common in countries such as the UK, the USA and Canada. The reduction in GPs workload may be sub-

stantial: at least some tasks of 39% of GPs consultation and up to 17% of complete consultations in the UK could be delegated. Such delegation could reduce GPs workload by 50% and patients are generally satisfied by the care performed by non-medical professionals (Richards *et al.*, 2000).

Finally, in the French context, Mousquès *et al.* (2010), using a controlled "before-after" study, highlighted that the delegation from GPs to nurses of two tasks concerning the following of patients suffering from type 2 diabetes (a systematic electronic patient registry of these patients and patient education in terms of nutritional-hygienic counselling) is effective and efficient. Actually, patients' follow-up and health outcomes are better in the intervention group (the team with task delegation) than in the control group (other GPs) without a significant increase in total costs.

Attitudes towards delegation of tasks from GPs to lower trained staff are essential when drawing a new policy. This paper informs policy makers on whether a more generous funding scheme might help in favouring tasks delegation. We make use of data where GPs have been randomly assigned to three hypothetic funding groups with increasing GPs financial contributions (none, partial, full). Based on these groups, we test whether reluctance to delegate based on risk aversion may be compensated by a less risky funding scheme (an assumption already partially tested in Höjgard *et al.* (2002) for instance).

3. Data

We use survey data matched with administrative data from the national Health Insurance Administration. Namely, our data come from the fifth wave of a bi-annual survey of self-employed GPs which was carried out in autumn 2012, and whose main topic was task delegation between GPs and nurses (for a presentation of the survey, see Massin *et al.* (2014)). GPs were told that a nurse would work at their practice for some day or half day duties. Each GP was randomly assigned to one of three hypothetic funding schemes (see Annex 2 for more details): fully funded (FF) by the social security administration (the nurse would be paid by the National Health Insurance Fund); self-funded by the revenues of GPs (Self Funded, SF) and a half of the two (Half Funded, HF). More than 2,000 GPs were in the sample of which 1,858 answered to the question whether they favoured task delegation.

Opposition to delegation is much larger where GPs are being asked to fund at least some of the delegation (Table 1). More than forty percent of GPs who belong to the fully funded group are opposed to the scheme while this proportion is of three quarters for those in the half funded and 82% in the self funded. This is not very astonishing as it is economically sensitive not to favour a scheme that either would for sure reduce one's income or is likely to increase it but for an uncertain amount.

Table 1: Opposition to delegation

	Fully Funded (FF)	Half Funded (HF)	Self Funded (SF)	All
Opposed	37.18%	75.24%	81.98%	64.89%
Favourable	62.82%	24.76%	18.02%	35.11%
Total N	616	614	627	1857

Source: Panel 2, DREES, URPS-ML, ORS

.3.1. Risk Aversion

This article investigates whether policy makers can counteract intrinsic characteristics of individuals. We test whether the three types of funding groups have a different impact on the role played by risk aversion in favouring task delegation. The survey measures general risk aversion of GPs by asking them their willingness to take risks on an 11-points scale. A similar scale is used to ask GPs about their willingness to take risks in three specific domains: financial, patients' health and own health (see Annex 1 for more details). GPs tell whether they are risk-averse (from 0 being very risk-averse to 10 being risk-prone). These questions are said to be good predictors of paid lottery choices (Dohmen *et al.* (2011)) but the question about patients' health was not addressed. Where one is risk-averse, one should be less likely to favour new institutional settings. We make the assumption that GPs who are risk-averse should be less favourable to task delegation.

We compute a synthetic score averaging the three previously presented risk-aversion scores whose value also ranges from 0 to 10. We observe that, as would be expected, GPs who are not in favour of the scheme of delegation are more likely to be risk-averse on average (Table 2).

Table 2: Summary statistics for risk aversion depending on GPs' willingness to delegate

Aversion	In favour of delegation	N	Mean	Std	CV
General	**All**	1470	4.787	2.277	0.475
	Yes	500	5.088	2.232	0.438
	No	970	4.623	2.283	0.493
Finance	**All**	1470	3.790	2.356	0.621
	Yes	500	4.046	2.306	0.569
	No	970	3.655	2.368	0.647
Patients health	**All**	1470	3.309	2.284	0.690
	Yes	500	3.584	2.259	0.630
	No	970	3.165	2.280	0.720
Own health	**All**	1470	5.131	2.399	0.467
	Yes	500	5.312	2.277	0.428
	No	970	5.032	2.460	0.488

Source: Panel 2, DREES, URPS-ML, ORS

.3.2. Regressors and Controls

The following five tables present descriptive statistics of our sample of GPs. We observe that 65% of male GPs and 69% of female GPs are opposed to the scheme (Table 3). The Group practice dummy tells whether GPs share offices with other GPs. GPs practising in groups ensure continuity of care and share the cost of capital investment but barely work together (Chevreul *et al.,* 2010, para. 6.3.1). Nearly three quarters of GPs working in solo practice are opposed to the scheme compared to 60% of those working in group practice.

Table 3: Likelihood to be in favour of the funding scheme according to gender and solo/group practice

	Male	**Female**	**Alone**	**Group**
Opposed	64.93%	69.48%	73.3%	60.03%
Favourable	35.07%	30.52%	26.7%	39.97%
Total	1018	403	663	758

Source: Panel 2, DREES, URPS-ML, ORS

The data is matched with administrative data on GP's activity. For each GP, the number of visits[4] is recorded. Therefore, we know with certainty the level of activity of the GP for each calendar year. If we consider that a GP works 40 weeks, then on average, each GP performs 128 acts a week, around 25 patients seen a day for a 5 days working week (Table 4).

Table 4: Daily workload (assuming 5 days a week and 40 weeks a year)

	Mean	**Standard Deviation**	**Median**	**P10**	**P30**	**P70**	**P90**
Activity	25.6	11.5	24.3	12.6	18.9	30.1	39.7

Source: Panel 2, DREES, URPS-ML, ORS

Based on the activity of the GPs, we observe that among the first quartile regarding the number of visits, 71% of the GPs are opposed to the scheme (Table 5). Those who are above the first quartile are more likely to be favourable with it (36-37% *vs.* 28%).

[4]Either when a patient came to the practice or when the GP visited a patient at home (the latter is common in rural areas and for overnight emergency visits).

Table 5: Likelihood to be in favour of the funding scheme according to the level of activity

	Activity below 1st Quartile		Activity above 1st and below 3rd Quartile		Activity above 3rd Quartile	
	Freq.	**Perc.**	**Freq.**	**Perc.**	**Freq.**	**Perc.**
Opposed	322	71.71	561	62.54	284	63.68
Favourable	127	28.29	336	37.46	162	36.32
Total	449	25.06	897	50.06	446	24.89

Source: Panel 2, DREES, URPS-ML, ORS

However, the number of hours worked is not recorded in administrative data. We only know the number of hours each GP declare they have worked the previous week of the survey (and, if the previous week as not a regular week, what would have been the number hours in a regular week). Only 6% of GPs declare that they worked less than 40 hours and 14% declare that they worked more than 80 hours (Table 6). Whatever the number of hours worked, there is approximately the same proportion of GPs who are opposed to the scheme.

Table 6: Likelihood to be in favour of the funding scheme according to the number of hours worked

	Below 40 hours		Between 40 and 80 hours		Above 80 hours	
	Freq.	**Perc.**	**Freq.**	**Perc.**	**Freq.**	**Perc.**
Opposed	71	66.36	910	64.45	169	68.15
Favourable	36	33.64	502	35.55	79	31.85
Total	107	6.06	1412	79.9	248	14.04

Source: Panel 2, DREES, URPS-ML, ORS

Finally, we observe that GPs opposed to the scheme are slightly older than those in favour of it (Table 7).

Table 7: Likelihood to be in favour of the funding scheme according to age

Age	In favour of delegation	N	Mean	St. d	CV	P25	P50	P75
	All	1858	50.66	8.077	0.159	46	52	57
	Opposed	1206	51.20	7.897	0.154	46	52	57
	Favourable	652	49.65	8.314	0.167	44	51	56

Source: Panel 2, DREES, URPS-ML, ORS

Then, differences may be substantial in the characteristics of GPs who are in favour of the delegation scheme, compared to the ones who are reluctant to delegate. The random assignment to a funding group seems to be especially correlated with whether the GP is favouring the scheme.

In our regression, we use the following controls too:

- **Geographic variables** such as GP's region of location (Burgundy, Pays de la Loire and PACA) and whether the practice is located in rural/semi-rural or urban areas. Rural, Semi-Urban and Urban variables are administrative variables created by the National Institute of Statistics and Economic Studies (INSEE in French) in 1999 based on 1998 census data. Urban areas are those that offer at least 5000 jobs and are not in the influence zone of a larger urban area. Semi-Urban areas are communes which are close to an urban area and at least 40% of employed and resident population of this commune is commuting to the urban centre or another commune within the influence of the Urban area. Semi-Urban and Urban areas form a continuous zone with no rural breaks. Rural areas are remotely and vaguely connected to urban centres, mainly rural communes. The last group represents 70% of France and two thirds of the communes (INSEE, 1999). GPs living in Rural and Semi-Urban areas are assumed to be more likely to favour delegation;

- **Characteristics of GP's practice at the micro-level:** whether GPs are in solo/group practice and GP's density in the area of practice (captured though the Local Potential Accessibility indicator developed by the IRDES; for more details see Lucas-Gabrielli, Nestrigue and Coldefy (2016)). According to Delamaire and Lafortune (2010) countries with a majority of group practice are more likely to have developed advanced nursing roles in primary care, the reason for this is that GPs are used to share tasks and therefore are more likely to delegate. At the macroeconomic level, a larger share of group practice within a country should help this country develop advanced nursing roles such as the one implied by delegation considered in this study. We would expect that at the micro level GPs practising in groups are more favourable to advanced nursing roles and to delegation.

  GPs practising in more GP-dense areas are more likely both to have lower revenues (Dormont and Samson, 2009) and to be sensitive to hedonic features of the area rather than income (Delattre and Samson, 2013). A policy that raises income should be more favoured by GPs who are more revenue prone. When talking about task delegation, we can wonder whether it raises GP's income or not. From one way, transferring some tasks to nurses can decrease GP's income in the short run because it can reduce the number of consultations or at least because the GP is asked to contribute to the funding of nurses' work. From the other way, task delegation to nurses can, in the long run, enable GPs to recover additional time to perform medical activities that he is the only one to perform. If one considers that the second effect is dominant, and thus assumes that task delegation should increase GP's income, one should observe that GPs in more GP-dense areas should be more likely to favour delegation, because task delegation could loosen the constraint on GP's income imposed by the competition with other health professionals (GPs and/or specialists).

- **GPs' workload** with the number of consultation and the number of hours worked. We expect that the higher GPs' workload, the higher their willingness to delegate tasks.

4. Model and Hypotheses

.4.1. Task delegation

The first hypothesis we test is whether GPs are more likely to accept to delegate tasks when being in one of the three different funding groups. Based both on what we observe in descriptive statistics and what economic theory states, we make the assumption that GPs who are in the self-funded group are less likely to accept task delegation.

We estimate a Probit model where the binary variable of interest is the willingness to delegate tasks explained by a set of explanatory variables and controls presented above. Not all GPs have answered every question. Therefore, we introduce variables by groups according to whether the number of observations decreases by adding a subsequent variable.

We estimate the willingness to delegate tasks with the following model:

$$y_i^* = \alpha_0 + \alpha_1 HF_i + \alpha_2 SF_i + \gamma_k X + \varepsilon_i \qquad \text{(Equation 1)}$$

Where y_i^* is a latent variable which is connected to the observed variable y_i by the following decision rule:

$$\begin{cases} y_i = 1 \ if \ y_i^* > 0 \\ y_i = 0 \ if \ y_i^* < 0 \end{cases} \qquad \text{(Equation 2)}$$

Where y_i is observed and equal to 1 when the GP *i* is in favour of the delegation. We make the usual Probit assumption that the error term in equation 1 follows a normal distribution. We are mainly interested in the coefficients of the dummy variables HF_i (half-funded scheme) and SF_i (self-funded scheme). These variables represent by how much GPs are more likely to favour the alternative funding schemes compared to GPs in the Fully Funded scheme (reference variable). We also estimate the vector of *k* parameters γ_k associated with the matrix (*i* rows and *k* columns) of other explanatory variables *X*.

.4.2. Risk aversion and task delegation

Risk aversion should be negatively associated with task delegation because a new policy such as this one may have the potential to change thoroughly how GPs work. In a country where GPs are used to work in solo-practice[5], introducing such a policy that involves working with someone else should affect GPs habits.

Risk-averse GPs are assumed to be less likely to delegate. As stated *supra*, GPs answered four questions about risk aversion. All questions implied that GPs ranked their risk aversion on a scale from 0 to 10, with 0 being very risk-averse and 10 being risk-prone. One question was a general question about risk aversion, one regarded risk aversion in financial matters, one risk aversion for patients' health and the last one risk aversion for own health. We expect that risk aversion for patients' health should have the strongest impact as task

[5]Even GPs who are in a group practice do not share a list of patients, they only share bills, capital investment and ensure a continuity of care (Chevreul *et al.*, 2010, para. 6.3.1).

delegation between GPs and nurses mainly implies risk for patients. In a first step, the model estimated included all the risk-aversion variables:

Estimation of the effect of risk aversion – Horse Race

$$y_i^* = \alpha_0 + \alpha_1 HF_i + \alpha_2 SF_i + \beta_1 RA_{Gi} + \beta_2 RA_{Fi} + \beta_3 RA_{PHi} + \beta_4 RA_{OHi} + \gamma_k X + \varepsilon_i \qquad \text{(Equation 3)}$$

Where RA_G (resp. RA_F, RA_{PH}, RA_{OH}) is the General (resp. Finance, Patients Health, Own Health) risk aversion measure.

From equation 3, we remove all the Risk Aversion measures except the Risk Aversion for Patients Health:

Estimation of the effect of risk aversion – Patients Health

$$y_i^* = \alpha_0 + \alpha_1 HF_i + \alpha_2 SF_i + \beta RA_{PHi} + \gamma_k X + \varepsilon_i \qquad \text{(Equation 4)}$$

If our risk aversion measures are robust, they truly measure the intrinsic risk aversion of GPs. In other settings, the measures of risk aversion that we use here have been found to be robust compared to other more complex measures (Dohmen *et al.*, 2011). Where a GP is risk averse, she should be less likely to delegate tasks to another health professional. Then, being less favourable to task delegation because of risk aversion should not be overcome by a less risky funding scheme. In other words, if our assumption is true, a GP for whom task delegation costs are fully supported by the National health insurance Fund should not be more likely to delegate than a GP who has the same risk aversion but is part of the self-funded scheme. If our assumption is wrong, then risk aversion should be overcome by the funding scheme.

The following model aims at testing whether there are substantial differences in terms of favouring the funding scheme depending on GP's level of risk aversion:

$$y_i^* = \alpha_0 + \alpha_1 HF_i + \alpha_2 SF_i + \beta_1 RA_{PHi} \times FF_i + \beta_2 RA_{PHi} \times HF_i + \beta_3 RA_{PHi} \times SF_i + \gamma_k X + \varepsilon_i \qquad \text{(Equation 5)}$$

Compared to equation 1, we have introduced three parameters that estimate the effect of risk aversion for the three random groups. *X* is the matrix of the explanatory variables from which we have removed risk aversion as it would then be co-linear to the three interaction variables.

5. Results

We analyse whether GPs are in favour of delegation. We introduce variables step by step in order to control the decrease in the number of observations[6]. We first introduce the funding dummies and standard controls: age, age squared and gender. Our reference for the funding scheme variable is the fully funded (FF) group.

[6]For some variables, there are missing values. Therefore, the number of observations decreases when introducing too many variables. By introducing variables step by step, we can observe whether the new variable and the decrease in the number of observations have an influence on the parameters of the previously introduced variables.

Table 8: Marginal effects of explanatory variables on GP's willingness to delegate: the impact of the funding scheme

	1	2	3	4	5
(Intercept)	1.51	1.36	0.92	0.98	1.26
	(0.96)	(0.96)	(0.97)	(1.33)	(1.34)
Half Funded	-0.30***	-0.30***	-0.30***	-0.28***	-0.33***
	(0.02)	(0.02)	(0.02)	(0.03)	(0.07)
Self Funded	-0.37***	-0.37***	-0.37***	-0.35***	-0.46***
	(0.02)	(0.02)	(0.02)	(0.03)	(0.05)
Female	-0.05*	-0.05*	-0.05*	-0.04	-0.04
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Age	-0.01	-0.01	-0.00	0.00	0.00
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Age Square	0.00	0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Burgundy		0.00	-0.01	0.02	0.02
		(0.06)	(0.06)	(0.07)	(0.07)
PACA		0.07	0.08	0.21	0.22
		(0.09)	(0.09)	(0.11)	(0.12)
Pays De Loire		-0.02	-0.02	-0.16*	-0.17*
		(0.07)	(0.07)	(0.08)	(0.08)
Rural		0.08**	0.08**	0.06	0.06
		(0.03)	(0.03)	(0.03)	(0.04)
Semi-Urban		0.06*	0.06*	0.05	0.05
		(0.03)	(0.03)	(0.03)	(0.03)
Group-practice			-0.10***	-0.09**	-0.09***
			(0.02)	(0.03)	(0.03)
Density of GPs				-0.04*	
				(0.01)	
Density of GPs * FF					-0.06**
					(0.02)
Density of GPs * HF					-0.04
					(0.02)
Density of GPs * SF					-0.00
					(0.03)
AIC	2084.00	2077.91	2041.21	1204.90	1205.72
BIC	2117.16	2138.70	2107.45	1269.54	1280.30
Log Likelihood	-1036.00	-1027.95	-1008.60	-589.45	-587.86
Deviance	2072.00	2055.91	2017.21	1178.90	1175.72
Num. obs.	1857	1857	1845	1066	1066

***p < 0.001, **p < 0.01, *p < 0.05

Aversion to risk

We argued that GPs who are not risk averse should be more likely to favour delegation. Task delegation is a major game changer in ambulatory care in France. In other countries delegation has led nurses to develop more advanced roles and this is something for which the French medical profession is unwilling to let it happen (Delamaire and Lafortune, 2010). If risk-averse, GPs should be less likely to favour delegation.

In a horse race (equation 3), we put the 4 risk aversion measures in the regression and only one measure was significantly associated with being in favour of the scheme: risk attitudes toward patients' health. The results of equation 4 in Table 9 show that GPs who are more risk prone are more likely to favour the delegation to a nurse. We observe that risk prone attitude is positively correlated with being in favour of task delegation. GPs who are more risk prone in terms of health of patients are more likely to be in favour of delegation of tasks. An increase of one standard deviation in the GP risk score increases the probability to favour delegation by 2%.

We now turn to the second assumption that we test regarding risk aversion: can financial incentives override risk aversion to delegation? We test this by introducing interactions between the funding group and risk aversion. If financial incentives can compensate risk aversion, then those GPs in the fully funded group should be less likely to disfavour the scheme when they are risk averse. The coefficient for the risk aversion variable is expected to be smaller and less significant for fully funded GPs compared to the two other groups. Table 9 presents the results for this specification which is introduced in model 8. We observe that the coefficient for the risk aversion variable is similar across the three groups and is always statistically significant.

Group Practice and Density

Model 3 is run with 12 observations less than the first two due to missing values for the solo-practice dummy which indicates whether GPs are in solo-practice or in group-practice. We find that GPs practising in groups are less likely to favour delegation by 9-10% compared to GPs in solo-practice, which is not the expected result. The variable "group-practice" is a bit rough as it does not give information on whether the GP is working with another GP or whether they merely share offices. It is quite common in France that GPs would share premises in order to share the bills, but then each would have their own patients (Chevreul *et al*., 2010, para. 6.3.1). Consequently, being in a group practice could only signal that GPs formerly decided to implicitly share the patient list, whose consequence is that their health services supply is not saturated. We find also that when GP's density increases by one standard deviation, GPs are less likely to favour delegation by 4%. That confirms that the short term effect seems to dominate. Task delegation seems to be perceived by GPs as a loss in earnings and, in a competitive context, they are less likely to delegate. The interaction between GP's density and the funding scheme highlights that only GPs who would be fully funded would be less likely to favour delegation. An increase in one standard deviation would decrease their willingness to delegate by 6%. The impact of competition is stronger for GPs who do not bear the cost of task delegation, which first appears counterintuitive but could be interpreted as GPs who share the cost of task delegation are more willing to see task delegation as an opportunity to cope with the high-level of competition.

Number of consultations and hours worked

GPs with a larger number of consultations are more likely to face time constraints. However, following a thorough sensitivity analysis, the number of consultations (or acts) does not bring any information to the models. The number of acts is correlated to rural and urban dummies with GPs practising in rural areas per-

forming 1000 more acts per year than GPs in urban areas.

The declared number of hours worked during the last week is not significant in models. We tried two dummies, one for those working less than 40 hours and one dummy for GPs performing more than 80 hours during the last week[7].

Age, Gender and Funding groups

Results in Table 8, column 1, for this first, naïve, specification are robust to the different specifications introduced latter. Half Funded or Self Funded GPs are less likely to favour delegation by 30% and 37% respectively. Females are less likely to favour delegation by 5%. There is no significant effect of age.

Geography

We find no evidence of favouring delegation being different for the different regions, Burgundy, Pays de la Loire and PACA compared to GPs in other regions[8]. More basically, the coefficient for Semi-Urban turns to be not significant in latter models. GPs who practice in remote places are more likely to be in favour of delegation as they might foresee more easily the effect and advantages of delegation for their practice. Marginal effects show that GPs working in rural areas are 8% more likely to favour task delegation.

[7]The number of consultation per working hour does not have any impact on being in favour of delegation. Neither putting the number of hours in nine different dummies, nor with only the decile that has the largest proportion of GPs in favour of delegation.

[8]These three regions are the ones for which there has been an inflated sample so that they are representative of GPs in these regions. A few of these GPs in these regions are also part of the national sample. Here, we introduce the three region dummies which then control for being in these regions relatively to GPs in other regions in France.

Table 9: Marginal effects of explanatory variables on GP's willingness to delegate: the cross impact of risk aversion and funding scheme

	6	**7**	**8**
(Intercept)	0.44	0.37	0.36
	(1.39)	(1.38)	(1.38)
Half Funded	-0.27***	-0.28***	-0.26***
	(0.03)	(0.03)	(0.05)
Self Funded	-0.34***	-0.34***	-0.35***
	(0.03)	(0.03)	(0.05)
Males	-0.02	-0.03	-0.03
	(0.03)	(0.03)	(0.03)
Age	0.00	0.01	0.01
	(0.02)	(0.02)	(0.02)
Age Square	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)
Burgundy	-0.00	0.00	0.00
	(0.07)	(0.07)	(0.07)
PACA	0.20	0.19	0.19
	(0.12)	(0.12)	(0.12)
Pays De Loire	-0.15	-0.14	-0.14
	(0.09)	(0.08)	(0.09)
Rural	0.07	0.06	0.06
	(0.04)	(0.04)	(0.04)
Semi-Urban	0.06	0.06	0.06
	(0.04)	(0.04)	(0.04)
Group-practice	-0.10***	-0.11***	-0.11***
	(0.03)	(0.03)	(0.03)
Density of GPs	-0.04*	-0.04*	-0.04*
	(0.02)	(0.02)	(0.02)
Risk aversion	0.01		
	(0.01)		
Risk aversion Finance	0.00		
	(0.01)		
Risk aversion regarding patients health	0.02*	0.02***	
	(0.01)	(0.01)	
Risk aversion regarding own health	0.00		
	(0.01)		
Risk aversion regarding patients health * FF			0.03*
			(0.01)
Risk aversion regarding patients health * HF			0.02*
			(0.01)
Risk aversion regarding patients health * SF			0.03**
			(0.01)
AIC	1108.59	1119.72	1123.30
BIC	1191.66	1188.37	1201.76
Log Likelihood	-537.30	-545.86	-545.65
Deviance	1074.59	1091.72	1091.30
Num. obs.	979	996	996

***p < 0.001, **p < 0.01, *p < 0.05

Table 10: Marginal effects of explanatory variables on GP's willingness to delegate: robustness checks (same number of observations in all models)

	1	2	3	4	5	7
(Intercept)	0.99	0.81	0.25	0.69	0.97	0.37
	(1.31)	(1.33)	(1.35)	(1.37)	(1.38)	(1.38)
Half Funded	-0.30***	-0.30***	-0.30***	-0.28***	-0.33***	-0.28***
	(0.02)	(0.02)	(0.02)	(0.03)	(0.07)	(0.03)
Self Funded	-0.37***	-0.37***	-0.37***	-0.35***	-0.46***	-0.34***
	(0.02)	(0.02)	(0.02)	(0.03)	(0.05)	(0.03)
Sex	-0.05*	-0.05*	-0.05*	-0.04	-0.04	-0.03
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)
Age	-0.01	-0.01	-0.00	0.00	0.00	0.01
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Age Square	0.00	0.00	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Burgundy		0.00	-0.01	0.02	0.02	0.00
		(0.06)	(0.06)	(0.07)	(0.07)	(0.07)
PACA		0.07	0.08	0.21	0.22	0.19
		(0.09)	(0.09)	(0.11)	(0.12)	(0.12)
Pays De Loire		-0.02	-0.02	-0.16*	-0.17*	-0.14
		(0.07)	(0.07)	(0.08)	(0.08)	(0.08)
Rural		0.08**	0.08**	0.06	0.06	0.06
		(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
Semi-Urban		0.06*	0.06*	0.05	0.05	0.06
		(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
Group			-0.10***	-0.09**	-0.09***	-0.11***
			(0.02)	(0.03)	(0.03)	(0.03)
Density of GPs				-0.04*		-0.04*
				(0.01)		(0.02)
Density of GPs * FF					-0.06**	
					(0.02)	
Density of GPs * HF					-0.04	
					(0.02)	
Density of GPs * SF					-0.00	
					(0.03)	
Risk aversion regarding patients health						0.02***
						(0.01)
AIC	1149.88	1149.07	1138.32	1134.38	1135.14	1119.72
BIC	1179.30	1203.01	1197.17	1198.13	1208.69	1188.37
Log Likelihood	-568.94	-563.54	-557.16	-554.19	-552.57	-545.86
Deviance	1137.88	1127.07	1114.32	1108.38	1105.14	1091.72
Likelihood Ratio Test		0.055	<0.001***	0.015***		(vs model 4) <0.001***
Num. obs.	996	996	996	996	996	996

***p < 0.001, **p < 0.01, *p < 0.05

Robustness checks, same number of observations across all models

As we can observe in both previous tables, the number of observations is going down from 1,857 to 996. The marginal effects of the HF and SF in this new specification, with an artificially decreased number of observations, are -0.30 and -0.37 in model 1 which means that these parameters increase when adding variables to -0.33 and -0.46 (see model 5 in Table 10). For the gender variable, the inclusion of risk aversion captures around one fifth of the size of the effect when the latter is introduced.

6. Discussion

This article shows that policy makers in France who would foster delegation of tasks have to be aware that a contract which no cost-sharing for GPs increases substantially their likelihood to delegate. But financial incentives fail to compensate for GPs' risk aversion to patient health. In this context, risk-aversion might be interpreted as the principal's intrinsic motivation not to delegate tasks to the agent and financial incentives implemented to enhance GP's willingness to delegate do not succeed in achieving this goal.
The economic literature has usually opposed intrinsic motivations to extrinsic ones (Kreps, 1997; Benabou and Tirole, 2003) and has evidenced that when agents have strong intrinsic motivations to do their work conscientiously, then they may not be willing to change their behaviours against a financial incentive (Deci and Ryan, 1985; Fehr and Falk, 2002).

Furthermore, there is substantial literature on whether economics incentives increase performance (See Camerer and Hogarth, 1999). The choice of favouring delegation is not a performance choice as there is no clear cut answer to whether delegation will increase performance. Therefore our study may suffer from a declarative bias because our design is quite in line with the empirical literature in experimental and behavioural economics about the impact of economic incentives on consumption choices or on votes for candidates for elections (see Harrison and Ruström (2008) for a review of choices in environmental studies) wherein it is well established that individuals tend to over report purchase behaviour and intention to vote (Camerer and Hogarth, 1999).

Our work is not without some limitations. At this time, our models do not control for the characteristics of health care demand in terms of objective health needs and socio-economic status (SES). It is of concern because we know that the supply of health care services strongly depends on patient's health status (GP's case-mix) and socio-economic status. For instance, we know that patients with low SES are less likely to be receptive to alternative care provision (Dumesnil *et al*., 2012) and maybe care organization (such as task delegation to nurses). A possible explanation could be that these patients tend to live in area where medical density, and thus consultation length, is small (Videau *et al.*, 2010). In the *Sniiram*, healthcare demand-side variables are scarce but we should at least introduce in the set of covariates the share of patients covered by the *Cmu* (the free compulsory health insurance for patient with low SES) as a proxy for the socio-economic composition of GP's practice population and the share of patients covered by the long-term disease scheme

(the French ALD scheme) as a proxy for GP's case-mix. These estimations are still in progress.

In this paper, the question used to study the coordination between GPs and nurses is quite evasive concerning the true nature of the relationship between both health professionals. It is not clear whether the nurse is salaried by the National health insurance fund or the GP. Yet, to know the true nature of the relationship of subordination between all the parties involved is of great concern. We can even imagine that a self-employed nurse (such as nurse practitioners in UK) could cooperate with a self-employed GP, both being paid with a fee-for-service scheme. Organizational arrangements and financial incentives interact to influence health professionals' coordination/cooperation.

Annex

Annex 1 : Question used to build the risk-aversion variables

"In this part of the questionnaire, we are going to ask questions about your attitude when facing uncertain situation in order to study how it affects your practice.
For the first question, we ask you to answer by considering your own self-perception.
In the following fields, give your position on a 0-to-10 scale (0 being associated with risk aversion and 10 with risk loving) concerning:
1. Daily-life events
2. The management of your own finances
3. Medical decisions influencing patient's health
4. Medical decisions influencing your own health"

Annex 2: Descriptive statistics about GP's risk attitude

	General risk aversion		Financial risk aversion		Risk aversion for patients' health		Risk aversion for own health	
Values	freq	%	freq	%	freq	%	freq	%
0	64	4,08%	136	8,67%	154	9,82%	51	3,25%
1	51	3,25%	118	7,53%	190	12,12%	58	3,70%
2	154	9,82%	261	16,65%	330	21,05%	135	8,61%
3	167	10,65%	209	13,33%	205	13,07%	146	9,31%
4	222	14,16%	186	11,86%	158	10,08%	169	10,78%
5	304	19,39%	276	17,60%	215	13,71%	297	18,94%
6	175	11,16%	122	7,78%	95	6,06%	183	11,67%
7	195	12,44%	87	5,55%	85	5,42%	214	13,65%
8	129	8,23%	73	4,66%	53	3,38%	158	10,08%
9	30	1,91%	16	1,02%	10	0,64%	43	2,74%
10	28	1,79%	23	1,47%	14	0,89%	59	3,76%
NSP	49	3,13%	61	3,89%	59	3,76%	55	3,51%
Total	1568	100%	1568	100%	1568	100%	1568	100%

Source: Panel 2, DREES, URPS-ML, ORS

Annex 3: **Questions asked to reveal GP's willingness to delegate tasks to nurses**

The following question is asked to the interviewed GPs:

"Let's admit that a law enables you to offer a part-time job to a nurse who would work at your practice for some day or half day duties. He/She would be paid according to three randomized scenarios:

- A lump-sum fully financed by the National Health Insurance Fund;
- The revenues generated by your self-employed activity for a half, the other half being funded by the National Health Insurance Fund;
- The revenues generated by your self-employed activity (integrally).

Would you be likely to delegate to him/her at least one task (whatever the type of tasks)?

1. Not favourable at all
2. Not really favourable
3. Almost favourable
4. Totally favourable
5. Do not know"

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