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Behavioural economic analysis of professionals' incentives in health professions

Written by EY and Open Evidence
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Behavioural economic analysis of professionals' incentives in health professions

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List of Abbreviations

AC	Autonomous Communities
CGCOM	*Consejo General de Colegios Oficiales de Médicos*
COMB	Official Medical College of Barcelona
CISNS	*Consejo Interterritorial del Servicio Nacional de Salud de España*
DG GROW and SMEs	Directorate-General for the Internal Market, Industry, Entrepreneurship
EC	European Commission
EU	European Union
GDPR	General Data Protection Regulation
JRC	Joint Research Centre
KOM	Kick off Meeting
INGESA	*Instituto Nacional de Gestión Sanitaria*
IRB	Institutional Review Board
MDE	Minimum Detectable Effect
MS	Member State
OE	Open Evidence S.A.
OMC	*Organización Médical Colegial*
RCT	Randomised Control Trials
SME	Small and Medium-sized Enterprises
SNS	*Sistema Nacional de Salud*
TS	Technical Specifications
UTOS	Unit, Treatment, Observation, Settings

ABSTRACT

Professional services markets are often deemed to be subject to persistent market failures, stemming from both information asymmetries and externalities, thus requiring specific professional regulation to ensure optimal market outcomes are achieved. However, the empirical relationship between such professional regulation – across all its different types and degrees of intensity – and the resulting service quality level (as well as the service's contribution to other public interest objectives) is not straightforward and requires further research to provide corroboratory evidence.

This study therefore seeks to contribute to both the theoretical understanding and the evidence base on factors determining or influencing the quality (and potential public interest orientation) of professional services, in this case in the health sector. The study employs behavioural analysis to focus on the motives that drive health professionals' behaviour towards their patients, including the incentives provided by professional regulation, and the elements that may induce medical professionals to change their behaviour.

The study employs a review of existing literature, input collected from health professionals via interviews, and a behavioural experiment conducted on two samples of doctors in Spain and in the Netherlands.

1 INTRODUCTION

The Final Report is the third major deliverable of the study concerning the Behavioural economic analysis of professionals' incentives in health and business services professions - Lot 1: Professionals' incentives in health professions: behavioural economics approach.

The Final Report takes account of the discussion held during the Interim Meeting, the exchanges that have been incorporated in the Interim Report, as well as subsequent email feedback from DG GROW and JRC staff members. The report presents the main results of the study, showing the main findings obtained from literature review, desk research and targeted interviews, as well as describing the behavioural experiment that has been performed and the related econometric and statistical analysis. Moreover, it provides a discussion of the potential policy implications emerging from the study.

Disclaimer

The research presented in this document is of a novel and exploratory nature and the findings should not be interpreted as intentions to or recommendations for making changes to the regulatory framework.

1.1 Key objectives of the study

The main objective in the current project is '*to contribute to the theoretical understanding and to the evidence base on factors determining or influencing the quality (and potential public interest orientation) of professional services in the EU*'.

Its strategic relevance resides not only in the above objective, but also on the main perspective it prescribes: '*The study is expected to employ behavioural analysis to focus on the motives that cause professionals to behave in a socially desirable way, including the incentives provided by professional regulation*'.

The preliminary discussion, which was presented in our proposal, unequivocally showed that the perspective of behavioural economics is the most appropriate to glean motivations and behaviours that are not strictly determined by utility maximisation. Such behaviours typically entail elements of pro-sociality and intrinsic motives, which the literature shows to underpin the behaviour of healthcare professionals. The team has whole-heartedly confirmed this approach throughout the study and has applied it to this report, in line with the findings of both the Interim and Inception Reports.

As healthcare is such an important pillar of our societies, clearly regulators cannot simply leave the achievement of quality to the good will of professionals. Accordingly, they have introduced various forms of regulation. Yet, policymakers should also consider evidence on the effects of such forms of regulation on market competitiveness and the quality of service provision.

Since such regulation may adversely impact competition, evidence is needed that this is offset by the positive impact regulation has on service quality. Demonstrating the causal effect of professional regulation on the quality of care has previously proven to be a challenging subject for empirical analyses. The approach proposed by the team for this study, which has been presented in detail in the Interim Report, proved successful in going beyond this challenge and has been able to provide some clear insights and inputs for assessing the impact of professional regulation in the healthcare sector.

1.2 Content and structure of the report

The Final report is structured as follows:

- **Chapter 1**, Introduction, covers both the background of the study and the objectives of this document;
- **Chapter 2** describes the methodology adopted for the study presenting the different strategies employed for data collection, literature review as well the experiment design and the related sampling and recruitment strategy;
- **Chapter 3**, Main findings of the study, illustrates the results of the literature review and desk research activities and the inputs received during the targeted interviews to healthcare professionals. Moreover, it includes a detailed description of the contribution of the aforementioned activities towards the refinement of the experimental design;
- **Chapter 4** describes in detail the behavioural experiment that has been performed by the team. It includes an econometric and statistical analysis of the results as well as a discussion of the experimental pilots and of the full experimental results;
- **Chapter 5** describes the final conclusions of the study;
- **Chapter 6** discusses the main policy implications emerging from the study and addresses them through specific and targeted recommendations;
- **Annexes** including:
  - Annex 1: Summary of selected studies for the literature review;
  - Annex 2: Full description of results stemming from the literature review;
  - Annex 3: Econometric and statistical analysis;
  - Annex 4: Full regression models;
  - Annex 5: References.

2 METHODOLOGY ADOPTED FOR THE STUDY

2.1 Data collection

Three major data collection activities have been carried out in this study:

- **Literature review**: We have performed a systematic review aimed at including a comprehensive search for evidence on a set of focused questions. Papers included in the review have been selected using clear and reproducible eligibility criteria. The review is elaborated upon in **sections 2.2 and 3.1** below.
- **Targeted interviews**: Interviews with health professionals (doctors in Spain and the Netherlands and pharmacists in the Netherlands and Italy), along with professional associations, at both the MS and EU level, have been performed to further fine-tune and validate the experimental scaffolding. The findings are provided in **section 3.3** below.
- **Regulatory review:** The goal of this review was to perform preparatory "deep dives" on the professional regulations selected for the experiment, conducting in-depth desk research of regulations relating to the selected professions in the two Member States (MS) involved in the experiment (Spain and the Netherlands). Broader deep dives (across all EU MS) were originally planned but have been reduced in scope following the Kick-off Meeting (KoM) and discussions held with DG GROW on 29/01/2019 and 12 /04/2019, also in view of the fact that the regulation of health professions is currently largely harmonised at the EU level.

This chapter draws conclusions based upon the triangulated findings of the regulatory framework research, the interviews performed and the literature review. These conclusions have informed the design of the experiment and are found in **section 3.4** below.

2.2 Literature review

2.2.1 Background

The study builds on extensive preparatory work summarised in the Inception Report. The literature review and desk research were conducted within the framework of the above-mentioned subtasks. The remainder of this chapter presents the methodology, the definition of the parameters and the main descriptive findings from the systematic literature review.

2.2.2 Methodology

Methodology

This section outlines the steps taken for the literature review process. This review followed a well-defined protocol and was designed as a roadmap detailing the objectives, the search procedure, and the inclusion criteria. The literature review was conducted following systematic principles in order to gain a thorough background knowledge of motivations and incentives for health professionals to conduct pro-social behaviour. It included literature published in academic journals using a pre-defined number of databases.

For the current systematic review, the following bibliographic databases were searched: PubMed, Cochrane Library, PsychInfo and EMBASE. The bibliographic search was conducted in 2019 and was restricted to peer-reviewed papers or dissertations written

in English. Additional papers were identified by hand searching the reference lists of the retrieved articles and previous systematic reviews. The search strategy that was used was the following:

Health professionals OR Health professions OR Health workers OR Health practitioners OR Health Service

AND

Licensing OR Licenses OR Licensed Profession OR Competition OR Reserved Activities OR Incentives OR Prosocial behaviour OR prosocial motivation OR Behavioural Economics OR Behavioural Economics OR Behavioural Science OR Behavioural Science OR Health Economics OR Health Economic OR Policy Regulation OR Professional Regulation OR Occupational Regulation OR choice architecture OR choice behaviour OR choice behaviour OR default selections OR Cognitive Biases OR Heuristics

AND

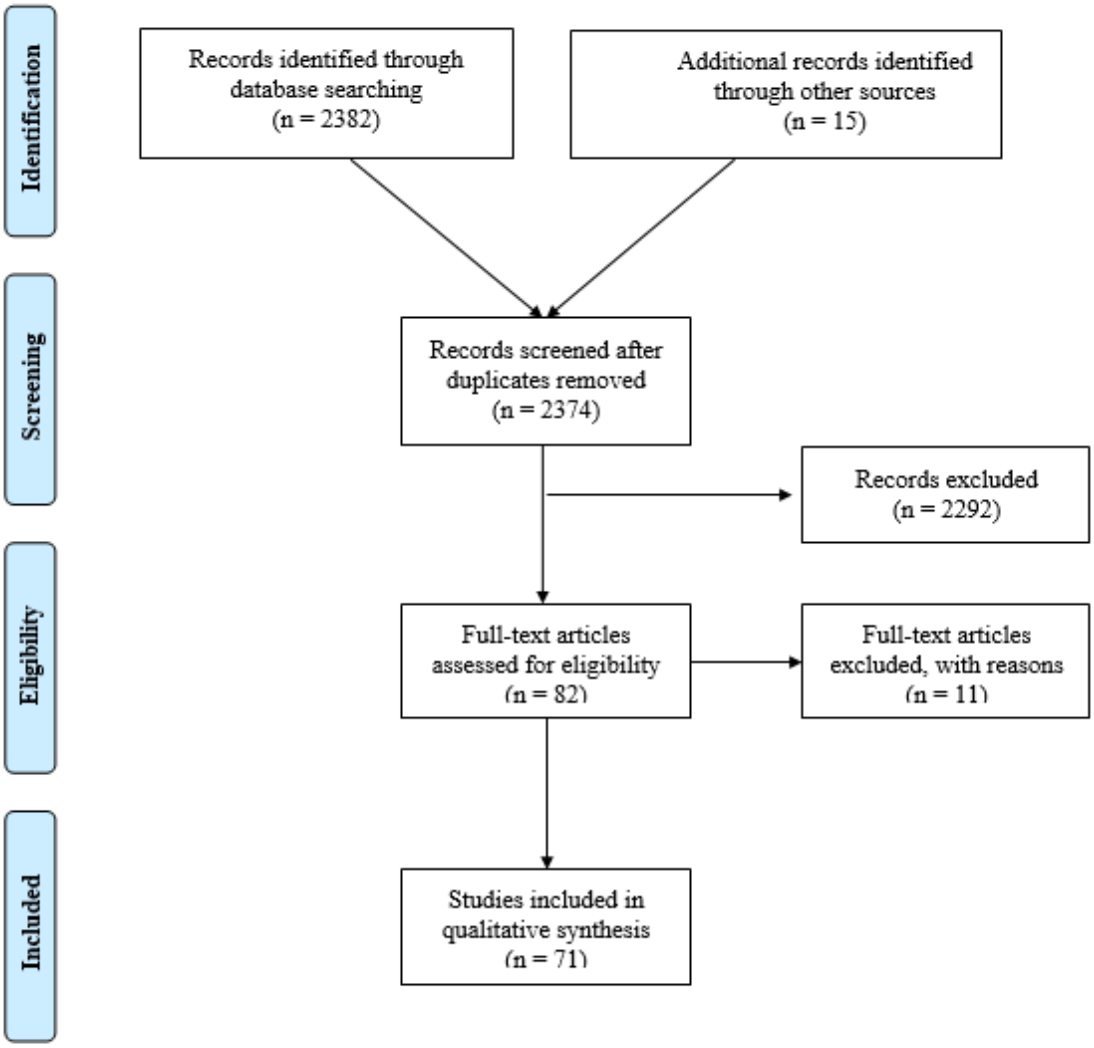
Effort OR Motivation OR Quality OR Professionalism

Inclusion Criteria

The inclusion criteria were studies that reported studies examining the effects of regulations, competitions, or other incentives of health professions on the effort and quality of service delivered to patients. Studies reporting different areas than healthcare / medical services were not included in the analyses, in agreement with the EC.

Two independent reviewers (Frans Folkvord and Cristiano Codagnone) screened the search results looking for studies that were considered eligible according the abstracts. Disagreements between reviewers were resolved by consensus. Figure 1 sketches the adapted PRISMA flowchart for the present literature review.

Figure 1 PRISMA flowchart



Source: Authors' elaboration.

2.3 Experiment design

As explained in the Inception Report, we proposed to design and conduct two laboratory experiments in two hospitals, respectively, in Spain and the Netherlands that agreed to be part of this study. The hospitals were:

- *Badalona Serveis Assistencials, Badalona, Spain (http://www.bsa.cat);*
- *Laurentius Ziekenhuis Roermond, Roermond, Netherlands (https://www.laurentiusziekenhuisroermond.nl/).*

Because of the COVID-19 pandemic, it was not possible to run the experiments with doctors from solely these hospitals and we needed to find doctors as participants from

other hospitals as well, to reduce the burden on the above-mentioned two hospitals. In the Netherlands, a coordinating doctor from the Laurentius Ziekenhuis Roermond collected the information from the participants to conduct the study, coming from several hospitals in the Netherlands (e.g., Radboud Universitaire Medisch ziekenhuis, Laurentius Ziekenhuis Roermond, Maastricht UMC).

The experiment took 30 to 60 minutes per participant and was developed in such a way that doctors and patients could conduct the experiment without any help from an experimenter, through an online portal. Clear explanations were provided in text through the portal in order to overcome variability in the explanation of the procedure. Moreover, the hospitals proposed to conduct the experiments by the doctors in their working time and all participants were paid a monetary incentive related to their performance in the experiment as to ensure their honest participation and motivation, mimicking their behaviour in a "real world" professional situation. As agreed, we controlled for personal level characteristics *ex ante* through selecting different groups of doctors and conducting randomisation, and then *ex post* in the analysis using the information gathered through pre and post experimental questionnaires. By recruiting participants from the same institution (where feasible), we minimised variability in many respects.

After the doctors finished their decisions in the experiments, patients were randomly assigned to one doctor and they conducted the experiments on the online portal. When both parties finished the experiment, we calculated their rewards and provided them with the payment.

In the following sections we will explain the experimental set-up in further detail. We discuss the modifications that we have conducted in the experimental design compared to the initial proposal, taking into account the KoM, the Inception Report meeting, multiple telephone calls and email exchanges with the EC and JRC services, the outcome of the interviews, and the systematic literature review. Subsequently, we provide a specific methodology for the empirical analysis (laboratory experiments) and outline the design at a high level of detail underscoring the relevance, soundness and generalisability of results.

Experimental design

Doctors were put into a basic trade-off: while solving case studies, they earned more by addressing more cases (regardless of the success rate), but patients could suffer losses if not enough effort was put in solving the case carefully. This captures the very essence of the decision function by a professional enjoying an information advantage, i.e. the potential conflict between the other-regarding-motive in their behaviour, and the profit-maximising objective.

To induce value in the lab, we foresaw both a doctor and a *"patient"*, although there was no actual interaction between the doctor and the patient, as this was too complex to organise taking into account logistics and time-management of the doctors. Therefore, we created a computer-mediated interaction, and we made the final payment dependent on the mediated interaction between the patient and the doctor.

There is a large body of evidence that doctors are pro-social. As a result, the presence of a real person (even though it is mediated in an online format) increases the saliency of the required effort that the doctors spent during the exercise. Existing literature follows this or similar approaches, to ensure the full focus on the experiment.[1] The

[1] For example, Finocchiaro et al. (2019) implemented a design by which the monetary equivalent of the patients' health benefit is transferred to an NGO.

"patient" was randomly assigned to a case study (referred to hereafter as "illness"), which was an autoptic report of symptoms and additional information on comorbidity and family health background. All cases were presented in a similar way, with a short introductory text, to make sure that the patients interpreted the information uniformly. The illness was associated to a potential loss: the patient was endowed with some money and the illness may have induced a negative endowment shock, whose probability was related with the choice of the doctor (i.e. whether it was a good or bad prescription), the choice of the patient to follow the prescription or not, and some background condition, e.g. specificity of the case.

The doctor had to analyse the case, make a diagnostic and prescribe some treatment, choosing among a variety of drugs and doses. This approach has been used elsewhere in the literature, developing case studies based on the problem-based teaching for medical doctors (e.g. Atehortúa, 2018). The *"patient"* may then have followed the advice or looked for alternatives. Once the decisions were recorded and the probability of outcomes were determined, conditioned on those decisions, a random draw assigned the result of the case study.

The hypothetical cases used in the experiment were developed in consultation with medical professionals, and their level of difficulty (i.e. being feasible to solve in the allotted time, but on the other hand requiring some effort) were further fine-tuned during the pilot of the experiment. In total, we selected a set of six medical cases balanced in their level of difficulty which were used across all experimental conditions. The same cases were used across all conditions.

What we have just explained was the experimental task. The second relevant block was the mechanism of assignment of subjects to conditions. The experiment that we proposed was a between/within subject design, with three regulatory framework conditions (control, market competition environment, and peer competition) assigned between subjects, multiplied by two within-subject conditions (health insurance pays for medicine or patient pays for medicine). Therefore, in total there were **six different experimental conditions and every subject was randomly assigned to only one condition** (*between-subject*) **in one factor but was exposed to two conditions in the other factor** *(within-subject)*. In other words, every doctor was assigned to one of the three competition conditions (control, market competition, and peer competition) and solved medical cases under two health costs scenarios (health insurance pays for the medicine or patient has to pay for the medicine). Randomisation was conducted at the individual level.

For the first factor, the three between-subject conditions were:

- **Control (C1).** The *"patient"* was randomly assigned to a case study (referred to as "illness"), which was an autoptic report of symptoms and additional information on comorbidity and family health background. The illness was associated to a potential loss: the patient was endowed with some money and the illness may have induced a negative endowment shock, whose probability was related with the choice of the doctor and the choice of the patient. The doctor had to diagnose choosing among four possible options. Then he/she had to prescribe a treatment choosing among eight options/alternatives per diagnosis (featuring both branded and generic medicines). The patient was fully informed that his/her choice determined the (monetary) outcome and the likelihood of the loss event. He/she could follow the prescription or do nothing. The payment of the doctor was unrelated with the choice of the patient (as in real life), however, there was a productivity premium related with the time of execution of the task. Patients received feedback concerning the outcome of their choice after each

round. In other words, after each round they saw if they had a loss or not. This applied to all conditions.

- **Market Competition (C2).** This condition was an environment simulating market competition. This means that in this case everything was equal to control, except that patients had the option to look for a second diagnosis made by another practitioner in the session, at an extra cost. After having received more than one prescription, the patient decided what action to take (practically, follow the prescription, follow the alternative prescription, or do nothing and face the risk). The probability of loss was determined by the correctness of the prescription chosen by the patient. We implemented a payment scheme for doctors based on three variables: (1) Fixed fee, (2) productivity bonus (i.e. the faster the cases were solved, the higher the pay-out – note that there was no time limit however, doctors could take as much time as they needed if they wished to forego the productivity bonus) and (3) reduced fee / loss if the patient asked for a second opinion and followed the prescription of a second doctor. In order to avoid any form of deception, the second opinion was randomly drawn from the pilot sessions of the experiment, conducted with doctors.
- **Peer Competition (C3).** This treatment evaluated whether professionals' incentives changed when engaged in situations that may have created peer pressure. The sense of belonging to the profession was expected to be very relevant and strong for doctors, strengthening the relevance of peer judgement.
- Therefore, at the beginning of the experiment the doctors were told that in the end we would inform every doctor about their success rate (number of correctly prescribed medical treatments out of six) and their ranking, in terms of quality, compared to peers that participated in the experiment, informing each doctor only about his/her own place in the ranking (this is, the percentile in the distribution), as well as a congratulation letter for the top performing ones.
  This information was anonymised to respect the GDPR considerations. This way we tested whether professional pride and recognition affected the results compared to the baseline condition, and whether it had more or less strong effect than competition.

The two within-subject conditions were:

- **Costs of medicine paid by health insurance (C1).** In this case the doctor was informed that the patient did not have to pay for the medicines themselves but that the health insurance (societal costs) would pay for the medicines that the doctors advised.
- **Costs of medicine paid by patient (C2).** In this case the doctor was informed that the patient had to pay for the medicines themselves and that it directly affected their financial situation.

The order of the within-subject conditions was random, but the medical cases were blocked by condition. This is, the condition "Costs for medicine paid by health insurance" had always the same three medical cases in random order (i.e. H-5844, H-5845, and H-5846), and the condition "Costs for medicine paid by patient" had always the same three medical cases in random order (i.e. H-5841, H-5842, and H-5843). The main reason of this methodological choice was to avoid adding more experimental conditions that reduced the statistical power of the sample by condition. In the regressions we controlled for order effects. We ensured that the blocks were comparable in the level of difficulty, by asking some doctors and pharmacists to evaluate and balance the blocks by the level of difficulty and effort needed. For instance, a comment made by a doctor in the pilot about the balance of difficulty between blocks was:

> *´The medical cases I needed to solve are definitely challenging and one needs to give it thorough thought. I believe they are well balanced, and at the same time I think older and more experienced doctors might find them more difficult because they have finished their educational training many years ago, while relatively new doctors might find it easier to complete the cases´ - Doctor*

As a caveat, although cases are expected to be well-balanced between conditions, the within-subject effect could potentially be influenced by differences in the level of difficulty in the medical cases. With the actual design it is not possible to identify if the effect is driven by treatment effect or by the level of difficulty.

In real life costs for medicines could be beyond the budget of patients (in particular considering the budget constraints for students participating in this experiment). The patients knew it was a hypothetical experiment, so the ecological validity of this effect is very limited. We used Experimental Currency Units, which was exchanged for real money at the end of the experiment. This allowed us to avoid the perception that prices of the medicines were too low, and is useful for full replicability in the future.

In addition, based on the results from the systematic literature review, we used **level of experience** and **employment status** (self-employment versus employment) as potential moderators (assessed by questionnaires) to take into account the differences between individual characteristics that might be important to understand the effects of regulations and financial incentives. In addition, doctors with **different levels of expertise and training** were targeted in the experiment to ensure representativeness. When conducting the analyses, we explore if there are differences in behaviour between practitioners who are more experienced and trained compared to those who are less experienced and trained.

Design and sampling

As discussed, we ran two laboratory experiments, one in Spain and one in the Netherlands. They had the same protocol, and the only differences were the leading experimenter and the language used to conduct the experiment. A professional company was hired to translate the protocol, to ensure the reliability of the translation. We intended to recruit doctors and senior students of a Master of Medicine to play the role of Doctor of Medicine, and undergraduate students from any major to play the role of the patients. Unfortunately, pharmacists were not willing to participate in the experiment. Therefore, we included only doctors with various backgrounds and expertise.

The current design envisioned two 3*2 mixed subject design experiments. There were six conditions, and for each condition around of 200 subjects participated, 100 per country. For each condition in each country, approximately 50 subjects played the role of Doctor of Medicine and approximately 50 subjects played the role of patients (from here on subjects playing the role of Doctor of Medicine are referred to as "practitioners", the other ones will be referred to as "patients"). This amounts to approximately 300 subjects per country and 600 subjects in total. The allocation is reported in **Table 1 and Table 2.**

The main reason for using real people instead of "bots" or the clinical cases alone is to increase the saliency of the task performed by the practitioners. There is evidence of a significant behavioural change between people interacting with machines and people interacting with real confederates. The practitioners and patients did not meet face-to-face in the experiment (which would not be recommended in any case because of lack of experimental control and reduction of social distance which is shown to affect

behaviour), but they interacted digitally, also in light of the logistics and time management constraints of the doctors. Moreover, in the current Covid-19 pandemic, this was the only feasible option. When the practitioners finished their part of the experiment, the diagnoses, patients were able to start their part of the experiment. Both parts of the experiment were complementary. Analysing medical cases with real people thus placed practitioners in a more ecologically valid situation (de Graaf & Malle, 2018; Thellman, Silvervarg & Ziemke, 2017).

Table 1 - Sample and conditions for the health cost scenario that health insurance pays for medicines

Country	Spain			Netherlands		
Conditions	Doctor of Medicine	Patient	Total	Doctor of Medicine	Patient	Total
C1	50	50	100	53	53	106
C2	52	52	104	51	51	102
C3	48	48	96	48	48	96
Total	**150**	**150**	**300**	**152**	**152**	**302**

Table 2 - Sample and conditions for the health cost scenario that patients pays for medicines

Country	Spain			Netherlands		
Conditions	Doctor of Medicine	Patient	Total	Doctor of Medicine	Patient	Total
C1	50	50	100	53	53	106
C2	52	52	104	51	51	102
C3	48	48	96	48	48	96
Total	**150**	**150**	**300**	**152**	**152**	**302**

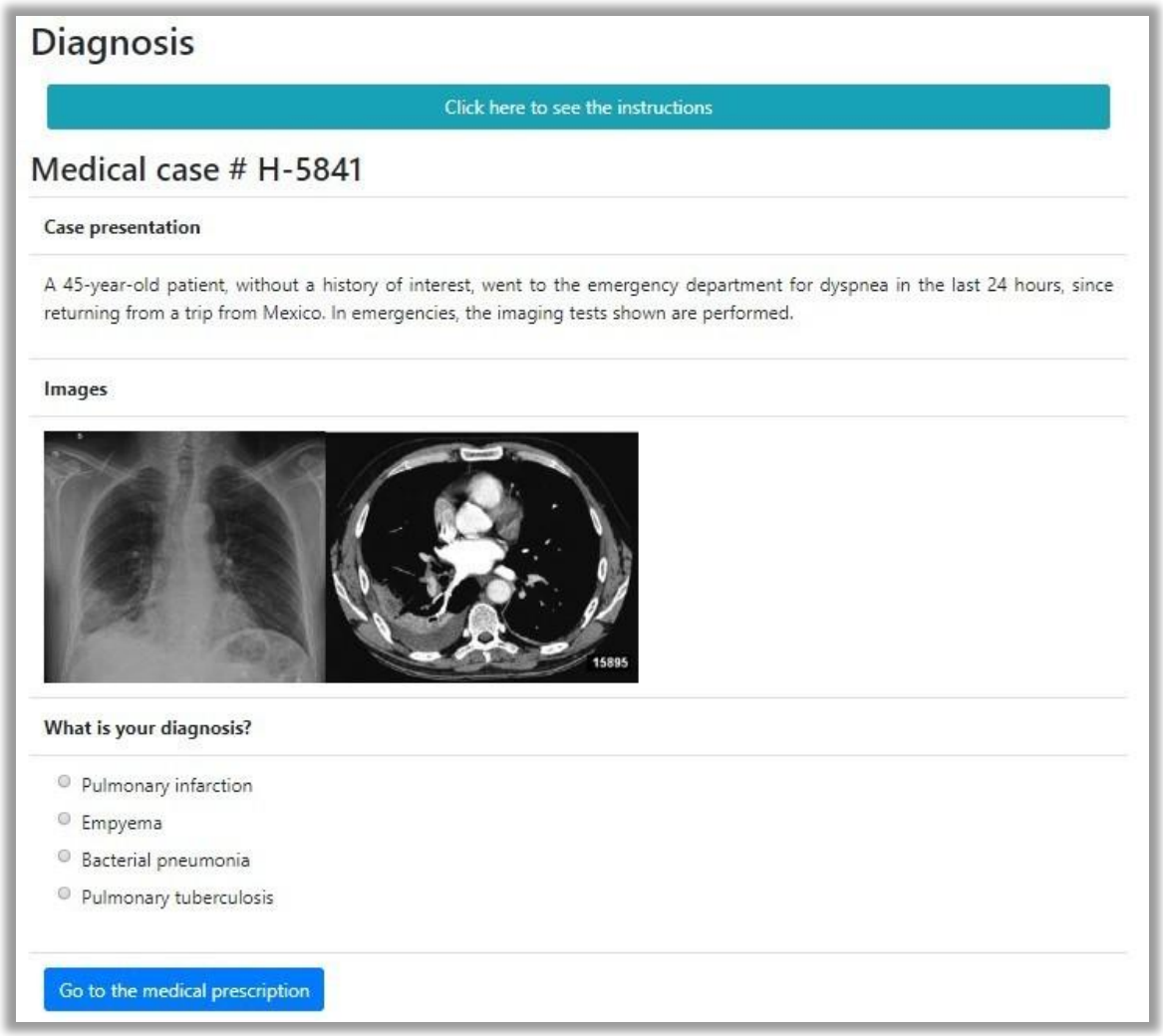
Source: Authors' elaboration.

Doctors with different levels of experience and training were targeted to participate in the experiment to ensure representativeness. It is relevant to observe, for instance, whether there is a difference between practitioners who are still in their basic medical training and those in their specialisation years. In addition, we aimed to have a variety of doctors who were both employed and self-employed, to examine whether there were differences between these groups. Finally, participants were asked to fill in a short questionnaire after the experiment to take into account some additional factors that seem to be relevant based on the literature review and the interviews (e.g., intention to be an entrepreneur, level of training, expertise, motivation).

Choice task for the Practitioners

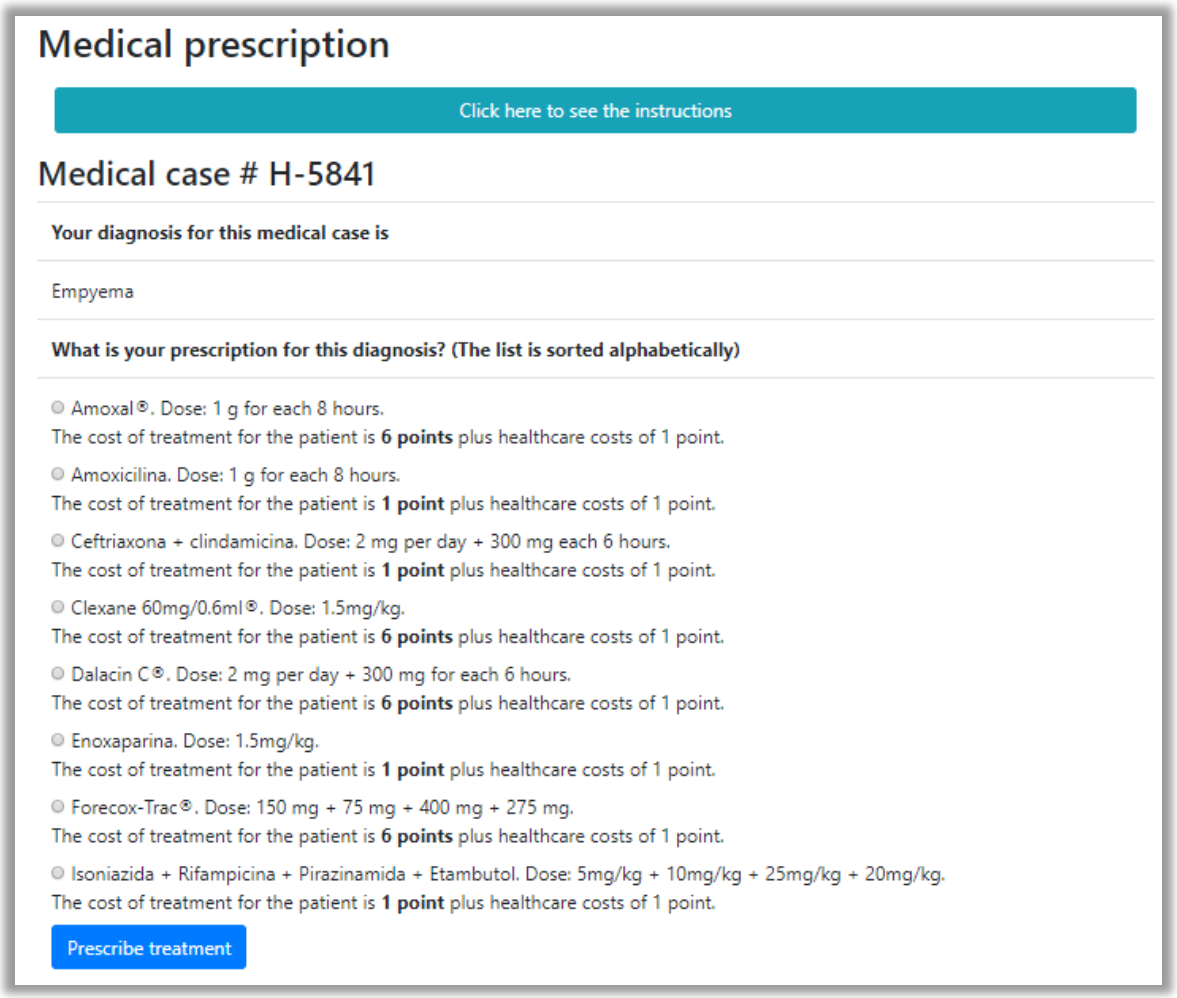
Practitioners were paid on the basis of the number of cases addressed. There were up to six cases. "Solving" a case involved two tasks: the practitioners must give a diagnosis and prescribe a medical treatment. During the analyses, we were able to disentangle the level of medical knowledge, training and expertise and the level of effort that a doctor spent on solving the case. Figure 2 shows an example of a medical case with three information blocks: Case presentation, Diagnosis, and Prescription. Each block provided important information to diagnose the disease: to make a correct diagnosis, the professional had to make an effort to understand the clinical case, paying attention to comorbidity and family background.

Figure 2: Mock-up of the medical case



For the medical prescription, they had to decide between eight different alternatives of pharmaceutical products within a list. The list contained both branded and generic pharmaceutical products (four of each). A brand-name pharmaceutical product is a medicine that has been discovered, developed and marketed by a pharmaceutical company under a patent protection, while a generic one has the same active components, but is produced by an imitator after the patent has expired. There were multiple variables that influenced the decision to choose for a branded or more generic pharmaceutical product, but because we were conducting a randomised controlled experiment we could only manipulate a certain number of factors and test for two different options, given the experimental constraints on the number of participants. This is illustrated in Figure 3 below.

Figure 3: Mock-up of the medical prescription



For each of the six medical cases on which the doctors had to diagnose and prescribe, health professionals received a fixed payoff of 40 points, regardless of the result of the treatment (in other words, irrespective of whether it was correct or incorrect). However, they had the option to improve the payoff in the following way. If they solved the medical case in less than three minutes, then they earned a productivity bonus of 10 points, if they solved the medical case in between three and ten minutes, they earned a productivity bonus of 5 points and if they solved the medical case in more than ten minutes they did not earn any bonus. The time intervals were adjusted based on the results of the pilot. In addition, in the competition condition the payoff of the doctor was reduced if the patient asked for a second opinion and followed the prescription of the second doctor.

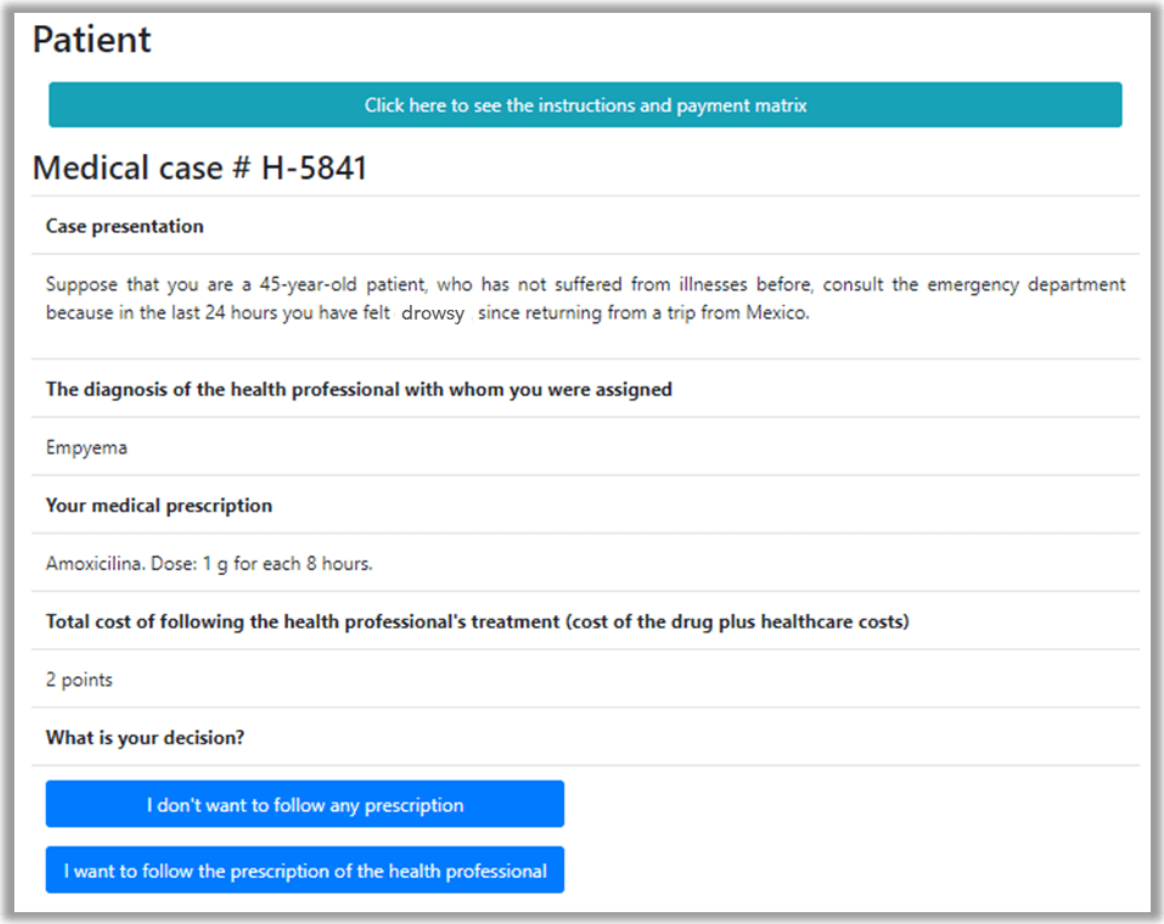
At the end of the activity, the program randomly selected a medical case among the set of six medical cases solved by the health professional. The payoff was the payoff earned in the selected medical case. To further clarify the mechanism of how the payoff was computed, consider that the computer draws the medical case number four. Suppose that in this case the health professional earned the productivity bonus of 5 points. The payoff, in this example, would be the fixed payoff plus the productivity bonus, i.e. 40 points + 5 points = 45 points. Note that health professionals did not know which of the

six medical cases were paid until the end, so they solved each case as if it were to be paid.

Choice task for the patients

Each patient was matched with a case study at every round. Each case study was an illness, with Case presentation and a prescription made by the health professional. After receiving the diagnosis and prescription by the practitioner, the patient had to decide whether to adhere to the prescribed treatment or not. Figure 4 below provides a mock-up of the decision page, programmed in oTree (Chen et al., 2016). In addition, under the condition Market Competition, the patient could search for a second opinion at a cost. The decision to follow the prescription or not affected the probability to face a loss.

Figure 4: Mock-up of the decision page for patients



Payment for the patient was determined according to the following rules. Out of the six rounds, one was selected at random. At each round the patient had an initial endowment (25 points). If the patient did not heal, he/she faced a financial loss (12 points). There was a small expected probability by the patient (20%) that the patient was cured without taking any drug. In the control condition, the patient decided whether to start with the medical treatment prescribed by a health professional or not. If he/she decided to start the treatment, he/she paid a cost for the treatment prescribed (say c). In this case, the likelihood of facing the loss depended on whether the prescription was correct, in fact, there were two possible scenarios: 1) if the medical prescription made by the health professional was correct, the probability of facing the loss was 10%; 2) if the medical

prescription made by the health professional was wrong, the probability of facing the loss was 90%. **Table 3** summarises all possible payments. At the end of the experiment, the patient was paid one of the six clinical cases randomly.

Table 3 - Patient Payments control condition

Case	Payoff when there is NO loss (20% chance of it happening)	Payoff when there IS loss (80% chance of it happening)
If patient decides not to follow any prescription	=25 points	25 points - 12 points = 13 points
Case	**Payoff when there is NO loss (10% chance of it happening)**	**Payoff when there IS loss (90% chance of it happening)**
If patient decides to follow the treatment of the health professional and the prescription is wrong	25 points - Cost of treatment prescribed by the health professional - 1 point (Healthcare costs)	25 points - 12 points - Cost of treatment prescribed by the health professional - 1 point (Healthcare costs)
Case	**Payoff when there is NO loss (90% chance of it happening)**	**Payoff when there IS loss (10% chance of it happening)**
If patient decides to follow the treatment of the health professional and the prescription is correct	25 points - Cost of treatment prescribed by the health professional - 1 point (Healthcare costs)	25 points - 12 points - Cost of treatment prescribed by the health professional - 1 point (Healthcare costs)

Source: Authors' elaboration

For market competition condition, if the patient decided to pay an extra cost of 3 points to see a second diagnosis made by another health professional, that payment was deducted from his or her initial endowment. That is, the initial endowment was not 25 points but 22 points. In Table 4, for the case when the patient pays for a second medical opinion, the initial endowment would be 22 points in each row.

Table 4 - Patient Payments market competition condition

Case	Payoff when there is NO loss (20% chance of it happening)	Payoff when there IS loss (80% chance of it happening)
If patient decides not to follow any prescription	25 points	25 points - 12 points = 13 points
Case	**Payoff when there is NO loss (10% chance of it happening)**	**Payoff when there IS loss (90% chance of it happening)**
If patient decides to follow the treatment of the health professional and the prescription is wrong	25 points - Cost of treatment prescribed by the health professional - 1 point (Healthcare costs)	25 points - 12 points - Cost of treatment prescribed by the health professional - 1 point (Healthcare costs)

Case	Payoff when there is NO loss (90% chance of it happening)	Payoff when there IS loss (10% chance of it happening)
If patient decides to follow the treatment of the health professional and the prescription is correct	25 points - Cost of treatment prescribed by the health professional - 1 point (Healthcare costs)	25 points - 12 points - Cost of treatment prescribed by the health professional - 1 point (Healthcare costs)
Case	**Payoff when there is NO loss (10% chance of it happening)**	**Payoff when there IS loss (90% chance of it happening)**
If patient decides to follow the treatment of the second health professional and the prescription is wrong	25 points - Cost of treatment prescribed by the second health professional - 1 point (Healthcare costs)	25 points - 12 points - Cost of treatment prescribed by the second health professional - 1 point (Healthcare costs)
Case	**Payoff when there is NO loss (90% chance of it happening)**	**Payoff when there IS loss (10% chance of it happening)**
If patient decides to follow the treatment of the second health professional and the prescription is correct	25 points - Cost of treatment prescribed by the second health professional - 1 point (Healthcare costs)	25 points - 12 points - Cost of treatment prescribed by the second health professional - 1 point (Healthcare costs)

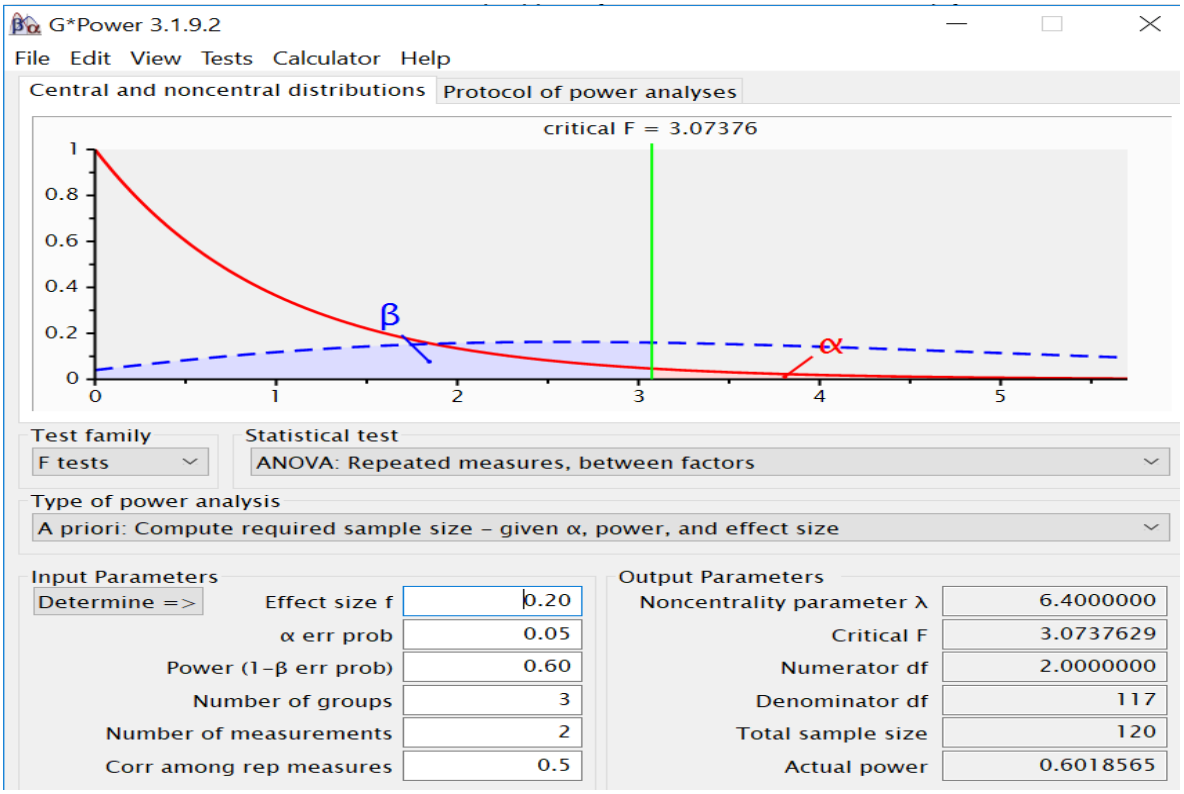
Source: Authors' elaboration

2.4 Sample size and recruitment strategy

The goal was to achieve around 100 subjects (50 doctors and 50 patients) for every experimental condition in each MS. This amounts to 300 subjects per country and 600 subjects in total. Participants were randomly allocated to one of the conditions. Based on optimal design rules, power analyses (G*Power[2]) suggest that N = 120 was expected to be sufficient to detect significant ($\alpha = 0.05$), medium effects ($f = 0.20$) of conditions (power = 0.60) (see Figure 5), where N is the sample size, α is the likelihood of type I error (probability of rejection of a true null hypothesis), f is the effect side expected (treatment effect), and power is the probability that the test correctly rejects the null hypothesis.

[2] Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*, 175-191

Figure 5: Statistical power



It is worth mentioning, as discussed above, that two hospitals (one in Spain and one in the Netherlands) initially agreed on participation in the experiment, but due to the COVID-19 situation we involved participants from various other hospitals and private health clinics as well.

In order to conduct valid and reliable experiments, it was necessary to create a context in which participants could fulfil the tasks included in the experiment without being disturbed, to overcome potential interference (e.g. lack of concentration, social influence, observation observer-expectancy effect). For example, experimenter bias occurs when an experimenters' expectations (be they conscious or sub-conscious) regarding the study bias the research.[3]

Since awareness of the experimental condition in which the participant operates could influence the behaviour of the experimenter, we conducted double-blind randomisation that assured experimental control.

[3] One famous example is that of "Clever Hans"[3], where von Osten claimed that his Orlov Trotter horse was able to do arithmetic and other difficult cognitive tasks. After having reached a large public interest and making a great amount of money, scientific researchers falsified his claims and proved that the horse read the posture and facial expressions of the questioner and could so identify the correct answer, instead of actually conducting cognitive tasks like arithmetic.

3 MAIN FINDINGS OF THE STUDY

3.1 Main findings of the literature review

A descriptive synthesis of the main insights gathered from the literature is provided below. A more detailed discussion of the results is presented further in the chapter and in Annex 2. Final insights for the experimental designs are also discussed.

Table 5 - Topic of the included studies

General topic of article	Number of articles[4]
Financial incentives	24
Organisational incentives and healthcare provision	22
Non-financial incentives	13
Motivation	8

Source: Authors' elaboration

3.1.1 Overview of the main factors affecting healthcare professionals' behaviour

The analysis of the available literature allowed us to identify some factors that might affect doctors' behaviours. In particular, four major factors were identified, and are represented in the Table below, together with some key possible effects on the behaviour of health professionals.

Factor/channel	Main possible effects on doctors' behaviours
Financial incentives	- Financial incentives can have adverse effects on the intrinsic motivation to make the best choices for patients
	- They could **improve doctors' performance,** for instance by periodically reminding them about possible areas for improving efficiency in their day-to-day practice. They can also reinforce doctors' perceived ability to perform successfully at work, while triggering a sense of accomplishment, and offering extra-income
	- However, they could **increase costs and reduce the intrinsic motivation** of doctors, with professionals increasing the number of visits but reducing the intensity of treatment, especially when they can charge a higher fee. - In addition, the presence of a system where insurance will pay for treatment, patients

[4] This column does not add up to 71, because some articles discussed more than one topic

Factor/channel	Main possible effects on doctors' behaviours
	consult more often, and physicians over-treat more often. - Research on the intrinsic motivation of health professionals found that those working in non-profit hospitals are, generally speaking, more intrinsically motivated to deliver quality services.
Competition	- Examined instruments that stimulate **competition** between hospitals or within hospitals provide inconclusive results - Competition between hospitals may be an important and significant driver of quality and can help improve patient outcomes (e.g. decreasing length of stay and mortality rates, stimulating better management)
	- **Consumer choice** is increasingly seen as a means to improve the quality and effectiveness of health service provision
Communication and peer review	- Open and honest discussion between healthcare providers and the patients and families is considered to be a **central feature of high quality and safer patient care**
	- **Communication among professionals** can provide them with an opportunity to relate ethical principles to real ethical dilemmas and problems in their work as well as to critically analyse ethical issues
	- Research showed that, while many professionals are intrinsically motivated to provide higher quality care**,** most of them respond to increased **prosocial incentives** in the form of scrutiny and encouragement from peers
Organisational and professional regulations	- Regulation creates the necessary framework, but excessive regulatory burden runs the risk of overburdening and micromanaging doctors
	- **Control registers** are generally implemented to increase control over the quality that health professionals deliver, but if excessive, may have detrimental results over the intrinsic motivation of health workers

Factor/channel	Main possible effects on doctors' behaviours
Other management and organisational incentives	- Elements such as good management, supervisors and managers' support can be a **powerful motivating factor** for doctors, and strengthening management capacities in health services can increase job motivation and improve the performance of professionals

3.1.2 Main results of the selected studies

This section presents the main results stemming from the analysis of the selected case studies. A more detailed presentation is provided in Annex 2.

Financial incentives

First and foremost, it should be mentioned how self-interest and responding to financial incentives are an unavoidable and potential beneficial aspect of human behaviour if these tendencies are directed into prosocial behaviour, thereby improving the performance of the national health service (Maynard, 2007).

Financial incentives can indeed have a **role in improving doctor's performance** (Lohman et al., 2017), for instance by decreasing the deficiencies in their day-to-day practice, strengthening the perceived ability to perform successfully at work and triggering a sense of accomplishment, instilling feelings of recognition and improving teamwork towards a common goal, while also introducing social pressure. On the contrary, Brekke et al. (2015) showed that general practitioners increase the number of visits, while the treatment intensity (e.g., prolonged consultations, lab tests, medical procedures) declines after they have obtained specialist certification and thus can charge a higher consultation fee. Moreover, Green (2014) conducted an experimental study and showed that physicians were intrinsically motivated to provide high quality, and that relying exclusively on extrinsic incentives to motivate physicians is detrimental to the quality of care and costly for the healthcare industry because it will have counterproductive effects on their motivation.

The actual **effect of financial incentives is therefore not clear and straightforward**. Further research is needed to establish how to improve quality across different domains, while minimising costs and overcoming any unintended adverse effects of payment for performance schemes. Gillam et al. (2012) therefore argue that healthcare organisations should remain cautious concerning the benefits of pay-for-performance schemes. In addition, Kane et al. (2019) demonstrated that analysing existing institutional, management, and governance arrangements and capabilities is also important, in particular when designing and implementing performance-based financing interventions. Performance-based financing cannot, on its own, overcome chronic system weaknesses; these can only be overcome by putting in place organisational change management processes, targeting both the system and organisational culture.

For instance, Werner et al. (2011) showed that tailoring **pay-for-performance programmes** to hospitals' specific situations could have the greatest effect on health care quality, with largest benefits present among hospitals that were eligible for larger bonuses, were well financed, or operated in less competitive markets.

Studies examining the use of financial incentives in developing countries show that the general perception is relatively positive (Bertone et al. 2016; Singh et al., 2015), although most participants included in the studies are still in favour of salary increases over pay-outs triggered by performance-based financing.

Altogether, the collected evidence points to the fact that intrinsic motivation of health professionals to behave pro-socially should be taken into account when designing healthcare policy, as financial incentives can have adverse effects on the intrinsic motivation to make the best choices for patient.

In addition, the interpretation of the pay-for-performance schemes by health professionals is essential, so communication on why financial incentives are included in the health provision is of great importance. Policymakers and healthcare providers should remain extremely cautious vis-à-vis the benefits of pay-for-performance schemes before introducing such mechanisms.

The potential effects of financial incentives were considered at the core of the experiment, when doctors were put in front of a trade-off based on financial incentives: earning more by solving more cases (regardless of the success rate), but patients could suffer losses if doctors did not put enough effort in solving their case.

Competition

Also, in this case, the available literature provides contrasting evidence on the effects of **competition** on doctors' behaviour.

Frakt (2015) argues that competition between hospitals is an important and significant driver of quality and can help improve patient outcomes; for example, it may decrease length of stay and mortality rates. In addition, where tested it stimulated better management, that subsequently is related to lower staff turnover, higher composite quality scores, lower lengths of stay, lower infection rates, shorter waiting times, and better financial performance.

In contrast, Barigozzi and Burani (2016) showed that health professionals working in **non-profit hospitals** are, generally speaking, more intrinsically motivated to deliver quality services, because the hospital sacrifices some profits to follow its mission and becomes attractive to motivated workers. Brekke and Sørgard (2007), and Moghri et al (2017) follow the same reasoning when it comes to dual practices, whereby physicians allocate their time and effort both in the public and private sector based on the public wage income and the private sector profits. The authors show that this results in lower overall health care provision, because it "crowds out" intrinsic motivation of health professionals to conduct their work. Therefore, the most effective intervention would be to ban dual practice, according to the authors, although offering a higher wage could also be a possibility; however, the latter option would inevitably lead to increases in general healthcare costs.

Gaynor, Morena-Serra and Propper (2013) studied the effects of reforms by the UK government to promote competition between hospitals. Patients were given the choice of location for hospital care and provided information on the quality and timeliness of care. The authors found a positive correlation between competition on saved lives without raising costs and reducing the length of stays. Subsequently, Gaynor, Propper and Seiler (2016) found that the elasticity of demand faced by hospitals increased substantially post-reform and that hospitals responded to the enhanced incentives by improved quality of healthcare provision.

The possibility to use a **second opinion** is another methodology investigated by the literature (Wanda et al. 2016), in particular to overcome issues related to information

asymmetry between doctors and patients. Introducing the possibility that patients may reject the first treatment recommendation and receive a second opinion (at a positive cost) significantly reduces physicians' overtreatment. Compared to the situation in which patients have to accept the first treatment recommendation, second opinions reduce the actual overtreatment (i.e. unnecessary care) level by nearly 40 percentage points, only by the "deterrent" effect of second opinions. "Threatening" health professionals with second opinions in the market might be a valid instrument to incentivise physicians and decrease the information asymmetry.

Communication and peer review

Concerning **communication between professionals and patients**, Harrisson et al. (2016) showed that an open and honest discussion between healthcare providers and the patients and families is considered to be a central feature of high quality and safer patient care. Semi-structured interviews with doctors and nurses were found to be critical in supporting open disclosure, for the following reasons:

(1) It should be considered as a moral and professional duty;
(2) Positive past experiences seem to be important;
(3) Perceptions of reduced litigation;
(4) Role models and guidance; and
(5) Clarity.

Greater openness in relation to adverse events requires health professionals to recognise candour as a professional and moral duty, exemplified in the behaviour of senior clinical practitioners and that seems more likely to occur in a non-punitive, learning environment. Recognising incident disclosure as part of ongoing respectful and open communication with patients throughout their care is critical. Ritter et al. (2018) showed that scientific findings across disciplines highlight consistent effects of legally required supervision on the delivery and cost of health services, while illuminating discipline-specific factors relevant to the understanding of a single profession and practice setting.

Another method is visitation among allied health professionals. Hofhuis et al (2006) showed that visitations by allied health professions, such as dieticians, exercise therapists, physiotherapists, dental hygienist, occupational therapists, podiatrists, and radiology assistants were considered as a very effective method to stimulate quality improvement. Participants intended to carry out two-thirds of the commendations, discussions led to an increased awareness of weak points and strong points, and actual improvements were also observed. In addition, Hopia et al (2014) showed that health practitioners in their final stage of education were concerned about providing quality of care in challenging situations and that multiple ethical dilemmas arose in their work.

Furthermore, (online) discussions among healthcare providers provided them with an opportunity to relate ethical principles to real ethical dilemmas and problems in their work as well as to critically analyse ethical issues. These discussions could and should be held during the education and in the practice and are important for health policy makers to take into account. A different solution was proposed by Oades et al (2010), who state that most mental health outcomes and satisfaction measures have been developed by academic researchers or service provider, and consumers have only been engaged as participants or advisors in a very limited fashion. Therefore, they came up with a consumer satisfaction questionnaire in which consumers work as collaborative researchers to increase face validity and relevance of research, examining health service provision.

Overall, it is important to examine effective sources of notifications of concern regarding the performance and conduct of health practitioners. Bismark et al. (2019) showed that patients and their relatives could be an important contributor in this area, next to colleagues and self-reporting. Participants in their study reported 78% of notifications of their health professionals regarding clinical performance, including diagnosis, treatment, and communication. Furthermore, self-reports commonly related to health impairments, such as mental illness or substance use. Other agencies played a role in reporting concerns about prescribing or supply of medicines.

Besides communication, scrutiny from peers seems to also be a factor. A laboratory and field experiment investigated whether health workers have intrinsic motivation to help their patients and confirmed that pro-social behaviour can be induced (Brock et al 2016). The authors observed clinicians 1) in their normal work environment, 2) when a peer observes them and 3) 6 weeks after an encouragement visit from a peer. They found that clinicians who give at least half of their endowment to a stranger in the laboratory (generous) provide 8% better quality care. In addition, the average clinician provides about 3% better quality when observed by a peer and 8% higher quality care after the encouragement visit. Importantly, they found that generous clinicians react to peer scrutiny and encouragement in the same way as non-generous clinicians. Many clinicians are intrinsically motivated to provide higher quality care; however, **most clinicians respond to increased prosocial incentives in the form of scrutiny and encouragement from peers**. These findings are important since they imply that healthcare institutions, through correct incentives, can also influence prosocial behaviour.

Organisational and professional regulations

When it comes to other means of organisations regulations, **control registers** are implemented in multiple countries, having an important role in a national strategy for control and improvement of health care quality Garpenby and Carlsson (1994). In addition, Bruns et al (2018) have tested electronic health records (EHR) that have been widely proposed as a mechanism for improving health care quality. The results supported the proposal that use of EHR systems can promote the use of client progress data and promote efficiency. However, there was little evidence of any impact (positive or negative) on overall service quality, fidelity, or client satisfaction.

Concerning professional regulations, the investigated literature provides a few inputs. By looking at the situation in the United States of America, Dower et al. (2013) showed that because regulation and licensure of health professionals falls to the individual states, such regulation may limit the effective and efficient use of the health workforce by creating mismatches between professional competence and legal scope-of-practice laws, potentially perpetuating a lack of uniformity. Dower et al. therefore propose to strengthen regulation in health professions, including aligning scopes of practice with professional competence for each profession in all states, assuring the regulatory flexibility needed to recognise emerging and overlapping roles for health professionals, increasing the input of consumers, basing decisions on the best available evidence, allowing demonstration/pilot programmes, and establishing a national clearinghouse for scope-of-practice information.

In general, multiple organisational regulations have been examined that affect healthcare provision. For example, instruments that stimulate competition between hospitals, or within hospitals were examined, providing inconclusive results. In addition, control registers are implemented in multiple countries, in order to increase control over the quality that health professionals deliver. The main disadvantage is that the intrinsic motivation of health professionals is decreased as a consequence of these regulations.

Another method to come up with an objective measurement of effectiveness of healthcare provision are cost-effectiveness analyses, that are becoming increasingly popular because they are based on a more objective methodology to establish the effects of interventions and societal costs that are related to the intervention. Finally, communication with professionals or patients is assessed as having broadly positive results, both for the health professionals and the healthcare outcomes.

Other management and organisational incentives

Although the general opinion is that financial incentives are an important instrument in motivating professionals to work harder and improve quality of their work, other **non-financial incentives** are also considered as important factors, in particular by health professionals themselves.

Daneshkohan et al. (2014) conducted a cross-sectional survey with health workers in Iran and showed that the main motivating factors for health workers were good **management**, **supervisors and managers' support** as well as good working relationship with colleagues.

In contrast, unfair treatment, poor management and lack of appreciation were the main demotivating factors. Strengthening management capacities in health services can increase job motivation and improve the performance of health workers. Special attention should be paid to some aspects such as management competencies, social support in the workplace, treating employees fairly and performance management practices, especially supervision and performance appraisal.

3.1.3 Additional elements stemming from selected studies

The analysis of the selected literature showed other important elements that intervene in shaping/influencing the decisions and behaviour of healthcare professionals.

Personal and interpersonal determinants of motivation

In general, **motivation** to conduct pro-social behaviour is essential for the long term (Franco, Bennett, & Kanfer 2002). Orsini et al (2016) have conducted a systematic review analysing determinants and outcomes of motivation in health professionals' education. Intrapersonal (gender and personality traits) and interpersonal determinants (academic conditions and lifestyle, qualitative method of selection, feedback, and a supportive learning environment) have been reported to have a positive influence on students' motivation to engage in academic activities. The result from this systematic review showed that motivation of medical students could be enhanced by changing the educational environment and by an early detection of students' characteristics.

Apathy and Yeager (2019) showed that motivation for public health workers to seek out training was mostly personal growth (82.7 % of respondents). Four motivational classes were clustered, (1) those motivated by organisational pressure and requirements, (2) those motivated indiscriminately by all factors, (3) those motivated primarily by personal growth and (4) those motivated by organisational accommodations and support. Furthermore, the results showed that public health agencies should consider the different motivational classes that were distinguished by Apathy and Yeager in the public health workforce because all groups should be motivated to participate in trainings.

Hammig (2018) shows that factors related to effort-reward and work-life imbalances are important factors reported by health practitioners that lead to burnout and the intention to leave the profession.

Scanlan et al (2019) showed that rewards and recognition, job control, feedback, and participation were associated with burnout, turnover intention and job satisfaction among Australian mental health professionals. In particular, the study found that burnout and turnover intention (i.e. the search for another job/though of quitting the current job) were positively correlated and both burnout and turnover intention are negatively associated with job satisfaction. In terms of specific aspects of work, higher levels of burnout were found to be associated with lower levels of perceived support from colleagues and supervisors, workload pressure, lower levels of perceived autonomy and client-related factors. In addition, job demands and emotional demands, shift work, and work-home interference were association with more exhaustion and subsequently with burnout.

How to empirically measure quality of healthcare services

In order to assess how **outcomes are affected by regulations and incentives**, it should be established what factors are important to assess as an outcome of the intervention. Duncan et al. (2012) showed that many services fail to deliver routine outcome measurements in practice. The study concluded that factors that influence clinicians' ability and desire to undertake routine outcome measurement are bi-directional: they can act as either facilitators or barriers, and that both facilitators and barriers to routine outcome measurement exist at individual, managerial and organisational levels. These factors include the level of knowledge and confidence about using outcome measures possessed by the professionals, along with the degree of organisational and peer-support professionals received with a view to promoting their work in practice. Routine outcome measurement may only be deliverable if appropriate action is taken at individual therapist, team, and organisational levels of an organisation.

Based on a discrete choice experiment, Koopmanschap et al. (2010) showed that severity of disease, costs per quality-adjusted life-year gained, individual health gain, and the budget impact were the most decisive decision criteria among policymakers, health technology assessment experts, and advanced health technology assessment students in healthcare priority setting. Health gains that include quality of life improvements were not crucial in decision making, although these are to be included in Dutch reimbursements dossiers for new drugs. Effective opportunities should be provided in order to be able to assess problems that arise in the motivation and efforts of health practitioners to conduct their profession to the best they can. Next, Gorman et al. (2008) mention that a mixture of quantitative and qualitative measures is needed to have a more valid and reliable assessment of health service quality. For example, Gorman et al (2008) propose that quality of incident and error monitoring systems should be used by healthcare providers, with a view towards:

- Determining job fit;
- Consequent informed revisions of training programmes and employment models; and
- The assessment of drivers and outcomes of clinical decision making.

Finally, Hanbury et al. (2011) have shown that it is important for interventions to have a theoretical base, explore the local context, and to use mixed and multiple methods of evaluation to establish intervention effectiveness. This is important especially since Neumann et al. (2009) clearly show there exists a large gap between academic researchers (in particular economists) and public health practitioners in measuring the "value" of the public health service.

Future research should seek to further develop the evidence-base for linking specific intervention strategies to specific behavioural barriers, explore the potential of theories that take into account broader social and organisational factors that affect health professionals' practice and focus on the process of data synthesis for identifying key factors to target with tailored interventions.

3.2 Main findings of the desk research concerning the Member States included in the experiment

Policy background on professional regulation of professions in Spain and the Netherlands

3.2.1 Regulation and governance of providers in Spain

The Spanish National Health System (*Sistema Nacional de Salud* - SNS) is the agglomeration of public health services in Spain. It was established by the General Health Law (*Ley General de Sanidad*) of 1986, and it has existed since.

From a governance and implementation standpoint, the management of most services has been progressively transferred to the different Autonomous Communities (ACs) of Spain. However, some services continue to be managed and operated by the National Institute of Health Management (INGESA), which is part of the Ministry of Health and Social Policy. The Interterritorial Council of the Spanish National Health Service (CISNS) is responsible for the harmonisation of the activity of these services, with the objective to ensure cohesion and to guarantee the rights of citizens throughout Spain.

Most of the providers in SNS are public sector entities, and the predominant governance model still has many elements of direct management inherited from the original integrated structure. The main tool of this model is the "contract-programme".[5] The contract-programme, which is signed between the health department and the regional health service every year, cascades down the managerial structures: each primary care area and specialised care area management team will negotiate their specific contract-programme with the regional health service and, in turn, will negotiate one each with hospital management in the area.[6]

The vast majority of final providers of care are part of the regional health service structure and are not autonomous legal entities. Thus, the contract-programme works as a tool to ensure objectives-based management. There is no stated penalty for failure to achieve objectives, nor any real risk-transfer to the providers; nevertheless, intervention is warranted to identify the reasons behind underperformance and to potentially correct them. Some positive financial incentives are derived from the accomplishment of certain strategic goals (for example, rational prescriptions, use of generic drugs, reduction of waiting times for certain procedures, etc.). These incentives are provided to both teams and individual professionals, though they are always marginal compared to the bulk of remuneration.

Access to the medical profession in Spain

Medicine can be studied in Spain in 42 Faculties of Medicine, affiliated to different Universities. The large majority of them are public Centres (31), while 11 are private. The admission to Medicine is governed in public Universities by the general principles of equality, merit and ability. Usually, they maintain a high level of transparency, although always with varying degrees (*Fundación Compromiso y Transparencia, 2016*).[7]

The degree in Medicine was the first in the Spanish University to introduce a fixed number of available positions, known as "*numerus clausus*" (Jefatura del Estado, 2007),

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[5] See also WHO review of healthcare legislation: Spain. Health System and Policy Monitor, WHO, 2017 https://www.who.int/health-laws/countries/esp-en.pdf?ua=1

[6] Ibid.

[7] See Joaquín García-Estañ, Studying Medicine and being a doctor in Spain, December 2018.

i.e. universities have a maximum number of students they can admit. As reported by Dr Joaquín García-Estañ, "*this figure is approved by the Autonomous Governments first, and finally by the Conference of University General Policy of the Ministry of Education. The main reason behind the need to establish numerus clausus was the admission of a number of students who could be adequately managed by the Universities, not only in theoretical classes but more importantly during hospital training*".[8]

In order to admit students to degrees with *numerus clausus*, all the Universities organise a preliminary step to full registration, called preregistration, in which they receive applications from students all over the country, since all the public Universities belong to the "common district". This process has received critiques[9] (García-Crespo, 2008; García-Crespo, 2009) given that each University organises this process autonomously, without a real coordination with the other Universities. This ends up forcing amny students to preregister at many Universities in order to make sure they complete the admission to at least one of them.[10]

Preregistration is a system by which only the students with the best scores are admitted. The preregistration system has also allowed the establishment of a ranking of Medicine schools based on these scores (*Ministerio de Educación, Cultura y Deporte*, 2018).[11]

Relevant literature, such as the recent 2018 paper "*Studying Medicine and being a doctor in Spain*" by Dr Joaquín García-Estañ of the University of Murcia has voiced the opinion that this mechanism does not necessarily ensure the best social outcomes. In particular, the cited report states that "*Each year thousands of students intend to study medicine, but many are foiled in the attempt despite having excellent records. Probably many of them could be good doctors if they had the chance. Conversely, the entry of students selected solely for their excellence in high school, without taking into account other factors such as vocation, does not ensure that we would have excellent doctors*".

Considering that the medical practice requires being conducted with the highest (professional and personal) standards, some authors[12] have suggested that the assessment of candidates in "*humanistic competencies as well as other personal qualities that may include, for instance, communication, compassion and commitment to service*" would be important.[13] Evidently, implementing these kinds of initiatives is not easy and needs a detailed assessment of medical education as well as university experts in order to ensure the fact that procedures adopted are satisfactory to all, and to maintain the features of the access to public education systems.[14]

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[8] Joaquín García-Estañ, Studying Medicine and being a doctor in Spain, December 2018.

[9] García-Crespo, C., First report on preregistration in Medical Schools of Spain (I Informe sobre el proceso de preinscripción y admisión en las Facultades de Medicina de España)', 2008; and García-Crespo, C. Second report on preregistration in Medical Schools of Spain (II Informe sobre el proceso de preinscripción y admisión en las Facultades de Medicina de España), 2009.

[10] Joaquín García-Estañ, Studying Medicine and being a doctor in Spain, December 2018.

[11] Ibid.

[12] Palés, J., *Admission of students to Faculties of Medicine*, Revista de la Fundación Educación Médica 21 (3), pp. 109-111, 2018.

[13] Jordi Palés-Argullós, 'Admission of students to Faculties of Medicine', Revista de la Fundación Educación Médica 21 (3), pp. 109-111, 2018.

[14] Joaquín García-Estañ, Studying Medicine and being a doctor in Spain, December 2018.

Access to postgraduate training: becoming a specialist

The State Official Bulletin is the instrument used by the Ministry of Health to publish, every year at the beginning of September, the offering of positions to enter the process of specialised health training, i.e., the positions offered to become a Resident in one of more than 50 medical specialties. This process is known as the MIR exam since MIR is the acronym designed for *Medico Interno Residente* (Internal Resident Doctor).[15] The exam is considered to be passed (and therefore the applicant is able to participate in MIR training) when the applicant obtains a minimum score that is equal to or greater than 35% of the arithmetic mean of the ten best ratings of the exercise, i.e. the so-called *cut-off score*. The academic record of the graduate is also evaluated.[16]

The report "Health at a Glance 2017" (OECD, 2017) reported how Spain is one of the OECD States with a relatively higher share of graduates in Medicine, 13 per 100,000 inhabitants, many more than other EU MS such as Greece, France, Italy, Germany and Belgium.[17]

Moreover, given the high demand to study Medicine, most people are left out of the process, since, at least in Spain, only the high school students with the best records are able to enter into a School of Medicine.[18]

Regulation and governance of the purchasing process

Regarding contracting with legally independent providers, the regional ministry of health/health department sets an overall budget and issues guidelines to be followed by the regional health services (or INGESA in the case of the two Spanish autonomous cities located in the African continent), which have delegated powers for using those pre-established resources. There is an enormous degree of variation in contractual details. These agreements may be of either a one-off or ongoing nature.

Regulation of the medical profession

The organisation tasked with the overall regulation of the medical profession in Spain is the Spanish Medical Colleges Organisation (OMC). The OMC includes both the General Council of Official Medical Colleges (CGCOM) and the Spanish regional medical colleges. The role of the OMC is to represent licensed doctors, ensuring proper standards and promoting an ethical medical practice.

Licensing is regulated by the 2006 Practice of Certified Professionals (*Ejercicio de las profesiones tituladas*), and no difference exists between registration and licensing for medical professionals. The specific details of the process are devolved to the Regions. In Catalonia, for instance, which is the location of one of hospitals in which the behavioural experiment was conducted, licensing is obtained through a written application through an on-line portal, also providing proof of qualifications. The process is managed by the Official Medical College of Barcelona (COMB). Collegiation is mandatory for all doctors and doctors who want to practice medicine in the territorial area of the province of Barcelona. COMB is the institution in charge of the registration of professionals and professional medical societies, and of guiding, monitoring and punishing, if appropriate, professional practice, with the aim to ensure good practice in accordance with ethical standards. The COMB is a professional corporation recognised by law, as recognised by

[15] Joaquín García-Estañ, Studying Medicine and being a doctor in Spain, December 2018.

[16] Ibid.

[17] OECD, Health at a glance 2017: OECD Indicators, 2017.

[18] Joaquín García-Estañ, Studying Medicine and being a doctor in Spain, December 2018.

the Spanish Constitution and the Statute of Autonomy of Catalonia. It is governed by its own Bylaws, in accordance with the Catalan Law 7/2006, of May 31, on the exercise of professional professions and professional colleges. It is Registered in the Register of Professional Associations of the Department of Justice of the *Generalitat de Catalunya*.

Quality regulation

Clinical practice guidelines. These ensure the development and dissemination of clinical guidelines linked to the implementation of national health strategies. The main tool is *Guía Salud*, a body of the SNS, that reports directly to the CISNS, and in which all Spanish Autonomous Communities (AC) participate.[19] It was created as the national methodological reference for elaboration and implementation of evidence-based instruments (including clinical guidelines). Its main goals are:

- The standardisation of methodology for the production of clinical guidelines;
- The assessment of guidelines produced in different parts of the SNS for dissemination;
- The development of clinical guidelines (often coordinating teams located in different regional systems) and methods for their implementation;
- The assessment of the implementation and penetration of their evidence-based products; and
- Training professionals in the use and production of clinical evidence.

3.2.2 Regulation and governance in the Netherlands

Healthcare in the Netherlands is covered by four forms of insurance[20]:

- *Zorgverzekeringswet* (Zvw) –for common medical care.
- *Wet maatschappelijke ondersteuning* (Wmo) – covering support services for people in need of additional care and home support.
- *Wet langdurige zorg* (Wlz) –for the provision of longer-term care.
- *Jeugdwet* – which covers short and long-term medical care for youths (under 18).

Dutch residents and employees are automatically enrolled in long term care by means of the Wlz described above. It is also necessary to subscribe to a basic healthcare insurance (*basisverzekering*), which does not include dental care.

Regulation of healthcare providers

Any organisation providing care under the Health Insurance Act (Zvw) needs to be licensed according to the Health Care Institutions Admission Act (Wet Toelating Zorginstellingen, WTZi). The Act also regulates for-profit providers[21]. As a general rule, providers of inpatient care may not be for-profit businesses, whereas those providing only ambulatory care may operate on a for-profit basis[22]. To obtain a licence, providers

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[19] See also WHO review of healthcare legislation: Spain. Health System and Policy Monitor, WHO, 2017 https://www.who.int/health-laws/countries/esp-en.pdf?ua=1

[20] See Güvenç Koçkaya and Albert Wertheimer, Pharmaceutical Market Access in Developed Markets (2018)

[21] See WHO review of healthcare legislation: The Netherlands. Health System and Policy Monitor, WHO, 2017 nld-en.pdf (who.int).

[22] See Schäfer W, Kroneman M, Boerma W, van den Berg M, Westert G, Devillé Wand van Ginneken E. The Netherlands: Health system review. Health Systemsin Transition, 2010; 12(1):1 – 229. These requirements include:

- A supervisory board should be installed with members who are not involved in daily management;
- The organisational structure should be laid down in the articles of association;
- Decisions of the supervisory board should be open to independent investigation, for instance by client boards;
- Responsibilities within the care institute or organisation should be laid down in a written document.

must "*comply with the budgetary rules provided by the Minister of Health, Welfare and Sport and fulfil transparency requirements from the Health Care Institutions Admission Act (WTZi)*"[23].

The Quality, Complaints and Disputes Healthcare Act (*Wet kwaliteit, klachten en geschillen gezondheidszorg, Wkkgz*) applies to large healthcare institutions as well as small healthcare providers and healthcare providers who work independently. The Wkkgz stipulates by law what constitutes good care and what should be done if people complain about the care. The law also obliges healthcare providers to ensure that incidents can be reported safely.

The Top Income Standards Act (*Wet Normering Topinkomens, WNT*) applies to healthcare institutions, youth care providers, health insurers and other organisations within the healthcare field, for example, certain patient organisations and knowledge institutes. Organisations that fall under the WNT are referred to in the Act as WNT institutions.

Regulation of individual healthcare professionals

Quality of care provided by individual healthcare workers is regulated through the Individual Health Care Professions Act (BIG). BIG aims to safeguard the quality of the practice of professions and to protect patients from incompetent healthcare practitioners. Similar to the Quality, Complaints and Disputes Healthcare Act (Wkkgz), this Act provides a framework for healthcare providers while details have to be worked out in lower-level regulation (Buijsen 2006). BIG contains requirements with regard to:

- Competence (requirements for registration and title protection);
- Expertise (the practitioner has to be an expert in the professional domain);
- Proficiency (stipulated restrictions and functional autonomy).

Furthermore, BIG regulates professional secrecy and, analogous to institutions, individual practitioners are bound to provide "responsible care" (Hendriks 2006). With regards to sanctioning of practitioner behaviour, the Act contains disciplinary rules[24]. The Health and Youth Care Inspectorate (*Inspectie Gezondheidszorg en Jeugd*, IGJ) enforces BIG. A 2002 evaluation indicated that professional organisations "were making an effort to comply with the Act regarding quality measures"[25].

According to BIG, healthcare professionals in the Netherlands need to register and hold a licence. Following registration and licencing, professionals are allowed to practise in the field of individual healthcare, on condition that specific titles are protected and certain listed actions, such as surgical treatments, are reserved to designated professionals. Indeed, the Act specifies that it is illegal to harm a patient's health. All professions that are regulated in article 3 and article 14 of the Wet BIG can be summoned to disciplinary tribunals. IGJ, based on assessment by the Board of Medical Supervision (*College van Medisch Toezicht*), can expel professionals in case due to incapacity related to physical or mental conditions or substance abuse[26].

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[23] Ibid.

[24] See WHO review of healthcare legislation: The Netherlands. Health System and Policy Monitor, WHO, 2017 nld-en.pdf (who.int).

[25] See WHO review of healthcare legislation: The Netherlands. Health System and Policy Monitor, WHO, 2017 nld-en.pdf (who.int).

[26] Ibid.

The profession manages and self-regulates the licensing of physicians. The umbrella organisation of associations of physicians, the Royal Dutch Medical Association, regulates the vocational training[27] and the licensing of medical specialists. The association also sets contents for the training of specialists, manages the accreditation of training institutes and trainers, as well as the requirements for re-registration of medical specialists[28].

Quality regulation

The Dutch policy on quality assurance has focused on professional self-regulation since the early 1990s. To this end, professional guidelines have been developed and are in use by the medical professions[29]. Guidelines provide rules of best practice for certain treatments and thus their application should improve quality of care[30]. Research in 2007 found that guidelines are usually developed by multidisciplinary teams, which may include nurses and representatives of patient organisations[31]. However, the inclusive process of developing guidelines is viewed by some as a potential bottleneck, especially in areas at the cutting edge of medical innovation[32].

By way of sanctions, BIG contains disciplinary rules in cases of lack of application of relevant guidelines. BIG is enforced by IGJ. Although BIG is seen as a tool for the protection of patients and governing quality, its effectiveness has been viewed as being limited by independent evaluations because its enforcement/sanctioning mechanisms tend to be underused[33]. There are five regional disciplinary boards (*Regionale Tuchtcolleges voor de Gezondheidszorg*, RTG) in the Netherlands, each with its own working area. The central disciplinary committee (*Centrale Tuchtcollege voor de Gezondheidszorg*) handles cases on appeal.

3.3 Main findings of targeted interviews with doctors and pharmacists

3.3.1 Overview of activities carried out

In order to provide a "hands-on" triangulation of the academic research performed, a series of interviews with healthcare professionals and corresponding associations were performed. The table below summarises the work carried out.

Table 6 – Plan of the interviews

Category	N. interviews performed	Category
Medical Associations	5	Doctors and Pharmacists

[27] In line with the minimum harmonised rules of the 2005/36/EU Directive on professional qualifications.

[28] See Schäfer W, Kroneman M, Boerma W, van den Berg M, Westert G, Devillé Wand van Ginneken E. The Netherlands: Health system review. Health Systemsin Transition, 2010; 12(1):1 – 229.

[29] Ibid.

[30] An example here, as reported in Schäfer W, Kroneman M, Boerma W, van den Berg M, Westert G, Devillé Wand van Ginneken E. The Netherlands: Health system review. Health Systemsin Transition, 2010; 12(1):1 – 229, are "*guidelines for GPs, developed by the Dutch College of GPs (NHG).*"

[31] See Groenewegen, Peter & Hansen, Johan & Bekke, S.. (2007). Professies en de toekomst: veranderende verhoudingen in de gezondheidszorg.

[32] See WHO review of healthcare legislation: The Netherlands. Health System and Policy Monitor, WHO, 2017 nld-en.pdf (who.int).

[33] Ibid.

Category	N. interviews performed	Category
Individual NL Doctors	5	Doctors
Individual IT Pharmacists	5	Pharmacists
Individual NL Pharmacists	5	Pharmacists
Individual ES doctors	5	Doctors

Source: Authors' elaboration

In total, 25 interviews have been performed. As it has not been possible to engage with Spanish pharmacists (see section 3.3.2 concerning the main challenges encountered), it was decided, in agreement with DG GROW, to select pharmacists in Italy for additional interviews.

The following questions were asked to the healthcare professionals:

Table 7 – Questionnaire for the interviews

Question #	Subject	*Question*
1	Licensing	*Do you think the effort needed to enter a licensed profession incentivises medical / pharmaceutical practitioners to invest more in upholding their reputation?*
2	Delegation of tasks	*Are there routine tasks associated with medical / pharmaceutical professions which in your view could be performed by professionals with a lower degree of training? How do these routine tasks affect the daily work of practitioners? Would allowing these routine tasks to be performed by less trained professionals automatically affect the quality of care?*
3	Joint practice and reputation	*Is being part of a joint practice with other doctors/pharmacists increases a practitioner's motivation to provide high quality services, for instance because the desire to uphold the "collective" reputation would be stronger than mere individual reputation concerns? Or are there other more general factors related to joint practices and peer control that could affect the quality of the service provided by your colleagues?*
4	Licensing	*Does overly restrictive licensing sometimes lead to a lack of practitioners in certain fields? If so, could this have a negative effect on the services practitioners provide, for instance due to short, hurried, delayed visits, differential geographic availability (for instance, shortages in rural areas) or a more general lack of accessibility of the particular medical / pharmaceutical service?*
4b	Licensing	*How does licensing keep up with the rapidly changing organisational and technical/digital innovations that are associated with the healthcare sector?*

Question #	Subject	*Question*
5	Peer example and influence	*Do you think the example of peers influences the decisions of your colleagues, such as frequency of antibiotics prescriptions or choice of brand vs generic medicines? Does the availability of information concerning the comparative performance of practitioners and hospitals affect the behaviour of medical practitioners? Do patients come equipped with such information?*
6	Ethical behaviour	*Are medical / pharmaceutical practitioners less likely to behave independently and ethically (i.e. in the interest of the client or the public at large),: (1) when the organisation for which they work is multidisciplinary and involved in activities that could be considered to create a conflict of interest if exercised within the same organisation (for example could doctors be tempted to refer patients to treatment facilities within the same organisation, when this could benefit them financially) or (2) when professionals are allowed to be shareholders (e.g.: Would practitioners compromise on the level of professional advice provided to patients on the quality use of medicines, feeling financial pressure to 'up-sell' to consumers, for example by recommending medicines or products that may not be necessary for the patient)*
7	Professional regulation and ethical behaviour	*More generally, do you think that the different forms of professional regulation (such as licensing, shareholding restrictions, advertising restrictions, tariff restrictions, etc.) have an effect on the practitioners' inclination to act in the public interest, including when this requires going against their own commercial interest or their client's desires?*
8	Competition	*Would introducing more competition have in your view any impact on the quality of medical services?*
9	Professional regulation	*How does professional regulation for practitioners in the medical / pharmaceutical professions help improve public interest goals, such as safety and public health?*

Source: Authors' elaboration

3.3.2 Main challenges encountered during interviews

While no issues have been encountered in engaging with doctors, pharmacists have been more reticent in participating in the study. Spanish pharmacists that have been contacted for interviews did not respond to the Consortium's invitation.[34]

3.3.3 Analysis of responses

An analysis of the responses is provided below, first disaggregated by question and by profession, and then presenting the main findings stemming from them. As little variance

[34] In order to proceed with the study, it was decided, prior consultation with DG GROW, to perform five interviews with individual pharmacists in Italy. This reticence implied that pharmacists were not likely to be good candidates for the experimental design. Indeed, in this light, and in agreement with the EC, it was decided to perform the experiment focusing solely on physicians.

was observed in doctor responses between MS, no MS disaggregation is deemed necessary in this regard.

3.3.3.1 Doctors

1. ***Do you think the effort needed to enter a licensed profession incentivises medical / pharmaceutical practitioners to invest more in upholding their reputation?***

All interviewed doctors mentioned that it is definitely important to ensure that everyone in the profession has a licence, to keep some sort of selection. However, doctors did not focus on the formality of the license itself, stressing that the importance of certification is more linked to the overall process of achieving the licensing and keeping it. In particular, the need to renew registration (in NL every 5 years) was seen as a positive aspect of licensing, as it incentivises doctors to keep up with training and studying, showing that you are a "modern doctor". It is definitely an incentive to continue studying, during the course of the practitioner's career.

Moreover, doctors generally agreed that the recognition of a licensed profession may be an important factor in upholding reputation, as it gives some public acknowledgment and standing to the practitioner. However, according to three professionals, licensing should not be linked to some sort of feeling that the profession is somehow "better than others". These interviewees mentioned that this feeling can be quite common among doctors (and surgeons in particular).

Two doctors disagreed with this view, mentioning that licensing is important in medical professions mainly because of the "punitive" element, rather than for upholding reputation: the risk to lose the license is a strong incentive to good behaviour in their view.

A number of doctors mentioned that to patients, licensing is not particularly important, as these in their view do not look at the fact of whether a medical doctor is licenced or not. According to them, reputation is more linked to the profession, not the license itself. Building a reputation over years of service performing the profession is viewed as sufficient in the eyes of the patient.

Finally, four doctors mentioned that licensing is an important "unifier" to medical professionals. Most professionals dedicate 10-12 years of their life to learn and train, so it is also quite a natural instinct to feel a sense of achievement once they are licensed. In this sense, respondents mentioned that doctors tend to recognise themselves as a part of a (large) group. Licencing is just something that helps in creating this group. In their view, the role of licensing is important in creating group identity. Moreover, as a medical career requires time, effort and money, reaching the end (obtaining the licence) gives a sense of achievement and corresponding reputation.

Interviewed associations provided a more formal viewpoint. In general, it was mentioned that licensing is not supposed to uphold a reputation; rather, it is a formal step to enter the profession.

2. ***Are there routine tasks associated with medical / pharmaceutical professions which in your view could be performed by professionals with a lower degree of training? How do these routine tasks affect the daily work of practitioners? Would allowing these routine tasks to be performed by less trained professionals automatically affect the quality of care?***

Doctors generally agreed that having "physician assistants" that perform routine tasks under the doctors' supervision would be useful. This would be better for both doctors (who can focus more on their core tasks, and less on bureaucratic and administrative activities) and patients (since such figures would be much more present and available than doctors and become a figure to turn to). There was near unanimity among respondents that certain tasks, such as administrative work, medical supplies check, some basic surgical procedures (e.g. applying local anaesthetics) could be delegated, for instance to nurses. In the view of interviewees, if such support figures were to receive adequate training, this form of delegation would not affect quality of care, and might even improve it, as doctors would have more time to focus on their "core business". Spanish doctors mentioned that in Catalunya, for instance, nurses are taking up some activities from doctors (family doctors in particular), so doctors can focus on core activities.

One doctor raised a relevant point concerning the importance of delegation: even when work is being delegated to professionals with lower degrees of training, the doctor should still be the person in charge, and driving the process. In other words, while the doctor may delegate others to perform some routine tasks, it is still up to him/her to ultimately decide, as he/she is responsible for the delegates (e.g. nurses) and the tasks they carry out on his/her behalf.

Associations mentioned that delegation is already being done fairly often. Different countries have different cultures and attitudes on this (e.g. what nurses can do – for instance, can nurses prescribe medicines? In SE the answer is yes, in DE no). More generally, it is viewed as being part of a lengthy process of transformation of (both) professions, and not affecting the quality of care under specific conditions (e.g. making sure doctors are involved in the process).

3. ***Is being part of a joint practice with other doctors/pharmacists increases a practitioner's motivation to provide high quality services, for instance because the desire to uphold the "collective" reputation would be stronger than mere individual reputation concerns? Or are there other more general factors related to joint practices and peer control that could affect the quality of the service provided by your colleagues?***

The resounding response from interviewed professionals and associations alike is that definitely yes, it is extremely important to talk to each other, receive suggestions and second opinions, also with a view towards correcting mistakes (which in turn could impact on the patient's health and the hospital and team's reputation). This is especially important in some groups (such as surgeons) where internal competition is perceived as quite high. The negative effect might be a degree of "creaming", as competitive specialists will want to work with other top figures in their field, leaving others out.

The majority of doctors also mentioned that they are strongly motivated to uphold the reputation of the hospitals they work in, and this can only be done by working cohesively with other practitioners. Moreover, doctors can support and review the work of colleagues, which in turn can increase the quality of care

Practical benefits were also mentioned: working in a team makes it easier to increase the homogeneity and uniformity of behaviours, as well as the creation of a sort of motivation to feed a "common reputation". This helps establish uniform and common protocols to be followed, with a daily obligation to compel and behave within certain limits.

4. **Does overly restrictive licensing sometimes lead to a lack of practitioners in certain fields? If so, could this have a negative effect on the services practitioners provide, for instance due to short, hurried, delayed visits,**

differential geographic availability (for instance, shortages in rural areas) or a more general lack of accessibility of the particular medical / pharmaceutical service?

From the perspective of the professional associations interviewed, licensing is not limiting to the profession. Associations mentioned that doctors can practice everywhere, and that while it is true that physicians tend to prefer urban areas, this does not depend on the licencing, rather on other factors that are unrelated to licensing (indeed, most highly skilled practitioners in any profession will tend to gravitate towards urban environments, as there is more opportunity for them).

Associations also mentioned that there is not a single EU country where there is an overflow of medical staff. Every country needs doctors. There is simply lack of doctors, especially in some specialisations; however, in their view licensing is not to blame for this.

Doctors in general did not see a problem with over-restrictive licencing. In their view, getting a licence (and becoming a full-doctor) is not "the complicated part", what is difficult is going through the entire process (from university onwards). It is the process which makes the selection so rigorous, as mentioned in the responses above.

4b. How does licensing keep up with the rapidly changing organisational and technical/digital innovations that are associated with the healthcare sector?

Responses to this question were provided for the most part by medical associations. These mentioned that in this regard, there are new learning modules that have been incorporated in university curricula (e.g., emergency medicine, forensic medicine, vascular medicine). Additionally, there are also new learning methods such as e-learning and continuous training. Associations added that here too licensing is not a key factor in their view, as it would be more something part of or related to medical studies that make professionals act in line with public policy goals and keep up with latest developments.

5. Do you think the example of peers influences the decisions of your colleagues, such as frequency of antibiotics prescriptions or choice of brand vs generic medicines? Does the availability of information concerning the comparative performance of practitioners and hospitals affect the behaviour of medical practitioners? Do patients come equipped with such information?

Responses were quite varied across doctors, according to their respective specialisations. Surgeons tended to mention that there was a high degree of homogeneity in behaviour, and that surgeons tend to talk to each other, help each other out, provide suggestions and reviews, as well as ask for each other's opinion, asking how they would do something. This spills over also in terms of ethical elements, as surgeons mentioned that they ask peers how they would behave in "grey" or borderline situations, and it is important to have a second opinion, especially if others already happened to be in a similar situation.

Interviewed practitioners also mentioned that snapshot studies can show how groups of surgeons do, how they react to complications, etc. In this sense there is a degree of intra-professional benchmarking between teams, promoting standardised behaviour around best practices.

Other doctors mentioned that there is also an element of seniority involved. A young doctor interviewed for this exercise mentioned that peer advice, especially in his situation (new to the profession), is key, and that young doctors strongly value the advice of senior doctors.

Three doctors mentioned that the behaviour amongst peers is not as homogenous as might seem at first glance, and that patients probably notice this, especially hospitalised patients (e.g. during the rounds in the morning, during which they see different doctors and experience different behaviours).

Associations mentioned that typically patients do not have the information needed to compare practitioner performance. They may have national benchmarks, but these might be hard to interpret. In this sense, interviewed associations mentioned that such information may be useful for health inspectors, who can glean details that patients may overlook or may not understand fully.

6. **Are medical / pharmaceutical practitioners less likely to behave independently and ethically (i.e. in the interest of the client or the public at large),: (1) when the organisation for which they work is multidisciplinary and involved in activities that could be considered to create a conflict of interest if exercised within the same organisation (for example could doctors be tempted to refer patients to treatment facilities within the same organisation, when this could benefit them financially) or (2) when professionals are allowed to be shareholders (e.g.: would practitioners compromise on the level of professional advice provided to patients on the quality use of medicines, feeling financial pressure to 'up-sell' to consumers, for example by recommending medicines or products that may not be necessary for the patient)?**

This question was the one in which greatest distance between responses of practitioners and associations was observed. Associations were quite adamant in responding that there is a fairly clear framework of law that can prevent conflicts of interests, along with professional and deontological codes that prohibit such behaviour. For instance, you cannot refer patients to institutions in which you hold a financial incentive.

Doctors were more sceptical. Most mentioned that they had not observed such behaviour, but that it is not possible to completely rule out external influence. They mentioned for instance that there are typically yearly meetings between surgeons, with brands of new equipment and types of medications that act as "sponsors" for the hospital. This may represent a potential conflict of interest, as it may influence professional and even institutional decision-making processes.

7. **More generally, do you think that the different forms of professional regulation (such as licensing, shareholding restrictions, advertising restrictions, tariff restrictions, etc…) have an effect on the practitioners' inclination to act in the public interest, including when this requires going against their own commercial interest or their client's desires?**

Interestingly, though doctors did not rule out the possibility of conflicts of interests (see question 6), they do not necessarily view more regulation as the solution. Doctors generally agreed in stating that they do not think that regulations have an important effect when it comes to public interest. A typical response was the following: "Medical professionals give preference to public interest despite the regulations in countries. It always comes first and natural", confirming the prosocial attitude assumption.

Doctors mentioned that regulation is useful in creating a framework, defining common elements that shape the profession and corresponding behaviours. The general sentiment amongst interviewed practitioners is that regulation is useful insofar as it codifies standards and boundaries that are already widely shared within the profession.

8. **Would introducing more competition have in your view any impact on the quality of medical services?**

The general sentiment, amongst both practitioners and associations is that competition would probably have a negative impact on the profession. In a nutshell, the view is that more competition would inevitably lead to a "price war" that could adversely affect quality. Moreover, practitioners mentioned that doctors would have additional burden (to reduce costs), having to take on other activities to increase revenues (e.g. advertising), so becoming a doctor would be more difficult and less attractive. Moreover, more competition could generate, in the view of interviewees, perverse incentives, such as cutting costs by reducing investment in education and training of physicians on the part of hospitals, which would reduce quality of care.

Doctors mentioned that, in a way, competition is already present and shaping the profession. However, they indicate that such competition does not focus on price, but rather on reputation and performance. Hospitals and doctor teams strive to be recognised as "the best": so the current setup fosters competitions mainly on quality (potentially also on price, but more in the sense of reducing waste rather than driving costs down). In this sense, competition might not be seen as 'detrimental' to quality of care, but rather incentivising it.

In the view of interviewed doctors and associations, besides reducing waste, there is not much that can be done to reduce the price of procedures, so more competition would inevitably lead to less quality. A simple example mentioned in an interview is that in some MS, pharmacists can provide vaccinations. However, while this measure may reduce costs, it does have drawbacks in terms of quality of care: there may be certain side effects doctors are trained to notice, while pharmacists are not.

9. How does professional regulation for practitioners in the medical / pharmaceutical professions help improve public interest goals, such as safety and public health?

In the view of interviewed physicians, it is important to have a regulation where necessary, but also to avoid unneeded red-tape. One doctor mentioned that at times he may attend to a patient for 10 minutes, and then have to fill forms for 15, which is not the best use of time. Again, physicians tied their responses back to the fact that regulation must provide a common, agreed-upon set of boundaries within which to practice the profession, not micro-manage every aspect of a physician's work.

In general, physicians felt that it may be beneficial to define some rules to make sure the patient is safeguarded, but sometimes they feel that these may be too many. Ideally, the ethical part of the profession is developed in university, during the physician's formative years.

Several physicians mentioned that there is a reason why someone chooses this profession: values are very important to them. In their view, such values need to begin in school, and grow in bottom-up fashion, not be forced by means of top-down regulation.

Associations were more favourable to regulation in general compared to doctors, mentioning that, in their view, regulation helps by providing increased patient safety and by looking out for the public interest, by setting minimum standards and limiting non-ethical behaviours. Indeed, in the view of interviewed associations, regulation is fundamental in the medical field, and, in their view, deregulating tends to reduce quality of care.

3.3.3.2 Pharmacists

1. ***Do you think the effort needed to enter a licensed profession incentivises medical / pharmaceutical practitioners to invest more in upholding their reputation?***

Interviewed pharmacists and associations were in broad agreement that licensing is very important to the pharmacist profession. This is due to the fact that it is not easy to obtain a licence, and professional pharmacists are registered as medical professionals. In turn, this increases their recognition and professional reputation.

To a greater degree than doctors, pharmacists underscored that licensing is very important to them. People choose to study and put a lot of effort in becoming a pharmacist, in all countries. When you become a pharmacist, your title is quite important, you are "recognised" also by other people in healthcare as a person whose opinion matters. In their view, this influences one's behaviour. In particular, according to three interviewees, this makes pharmacists feel responsible for the advice they provide. Being licensed means they have the 'authority' but also the responsibility to provide advice and give opinions to patients, and that this responsibility is based on and proven by the professional recognition they received by getting the license.

In general, interviewed pharmacists agreed that the licensing is an important element for the reputation of the profession, but that, in the end, as it is for doctors, it is desire to uphold professional standard that causes members to behave in a certain way, not the licensing.

However, some mixed opinions were recorded. A couple of pharmacists disagreed with this view, mentioning that not all colleagues they know think the same, and that it may be the case that colleagues may be giving advice that is not entirely evidence-based (i.e. based on personal opinions, religion, background, etc.). Several pharmacists also mentioned that a generational divide might be present, as older pharmacists may be more attached to the status of the title compared to younger ones.

Others mentioned that licensing is an incentive to improve one's practical knowledge, also in terms of communication of healthcare as a "community" of pharmacists, where you have significant contact with patients. In this sense licensing is viewed as being necessary, as it allows pharmacists to communicate with others having a certain status (i.e. be able to communicate with doctors on a similar level), with the recognition of a certain title and profession.

Overall, compared to doctors, pharmacists tended to stress the importance of licensing to a significantly larger degree.

2. ***Are there routine tasks associated with medical / pharmaceutical professions which in your view could be performed by professionals with a lower degree of training? How do these routine tasks affect the daily work of practitioners? Would allowing these routine tasks to be performed by less trained professionals automatically affect the quality of care?***

The views of pharmacists were quite similar to those of doctors, cited above. In their view, for some managerial, administrative and logistical tasks (such as invoicing, inventory storage) you don't need to be a pharmacist. However, as doctors also mentioned, for these tasks, one should also take into consideration the need for some professional knowledge that can be relevant (e.g. for instance regarding an order of some drugs or controlling some shipments). Clearly a pharmacist can focus on "core tasks", and delegate other tasks, but he/she will always be responsible for everything that happens in the pharmacy (including management/administration).

Other pharmacists agreed, mentioning however that you cannot outsource these routine tasks entirely to less trained people, because they may not be able to carry out the entire

task/process on their own. On this point, interviewed pharmacists stated while you can outsource routine activities, a pharmacist should always be involved at some point.

Two respondents mentioned that computers can replace human assistants in some areas (e.g. logistics until the medicine comes to the pharmacy), increasing efficiency and giving more time to pharmacists to focus on key activities and tasks.

3. ***Is being part of a joint practice with other doctors/pharmacists increases a practitioner's motivation to provide high quality services, for instance because the desire to uphold the "collective" reputation would be stronger than mere individual reputation concerns? Or are there other more general factors related to joint practices and peer control that could affect the quality of the service provided your colleagues?***

Pharmacists mentioned that for them joint practices are not an influence, and that they would behave in the same fashion even without a joint practice. On the other hand, they generally agreed that having some peer review, exchange of information and support in making decisions can help, especially when you are young. Having a joint practice, having colleagues to help you out generally increases the quality of service provision in their view.

One pharmacist mentioned that individual pharmacists may be more tempted (and facilitated) to make decisions for their own sake and benefit, while if you work in a group such behaviour is less likely and more difficult to do so.

In general, reputation is seen as very important. Pharmacists mentioned that of course the organisations make sure that pharmacists do not do anything illegal, but if you work in a team you want also your colleagues to be on the "safe side", as their reputation is your reputation as well. In small pharmacies it was mentioned that you work mostly alone, but with a lot of communication in the process and linked to a network of professionals.

Interviewed pharmacists all were used to exchanging opinions among colleagues, also with a view to give answers to clients that are as comprehensive, relevant and competent as possible. Of course, the reputation of the pharmacy influences all employees, and everyone tries to do their best to raise it. Some interviewees mentioned that some pharmacists may tend to "compete" with colleagues, or are very much under pressure from the boss, who can strongly influence decisions and choices (for instance towards some products), but this very much depends on the context.

Moreover, working together is seen as favourable to achieve a higher standard in quality of service, also because you can delegate tasks to each other, freeing up some time to train, research, ask for advice, and learn from each other. Working in group also means that you can have meetings with colleagues on ethics to discuss how to behave in certain cases/situations.

4. **Does overly restrictive licensing sometimes lead to a lack of practitioners in certain fields? If so, could this have a negative effect on the services practitioners provide, for instance due to short, hurried, delayed visits, differential geographic availability (for instance, shortages in rural areas) or a more general lack of accessibility of the particular medical / pharmaceutical service?**

Pharmacists were not sure how to deal with this question and did not provide a definitive answer. A number of them suggested this topic applies more to physicians rather than pharmacists, but did not elaborate further.

4b. How does licensing keep up with the rapidly changing organisational and technical/digital innovations that are associated with the healthcare sector?

As was the case for the previous question, pharmacists did not provide a definitive answer to this question, as they did not consider it to be applicable to their professional context.

5. **Do you think the example of peers influences the decisions of your colleagues, such as frequency of antibiotics prescriptions or choice of brand vs generic medicines? Does the availability of information concerning the comparative performance of practitioners and hospitals affect the behaviour of medical practitioners? Do patients come equipped with such information?**

Pharmacists generally agree that they tend to influence each other, providing suggestions and pointing out mistakes. They mentioned there are many "grey areas" in the profession, and you tend to ask and discuss about them with your colleagues. In a group this is quite a "natural" dynamic, in a single pharmacy it is more difficult and less used.

Other pharmacists mentioned that the influence is more understated, becoming "silent" and "automatic" in the medium-long term, as you end up adapting in some ways to the prevalent behaviour amongst colleagues.

6. **Are medical / pharmaceutical practitioners less likely to behave independently and ethically (i.e. in the interest of the client or the public at large),: (1) when the organisation for which they work is multidisciplinary and involved in activities that could be considered to create a conflict of interest if exercised within the same organisation (for example could doctors be tempted to refer patients to treatment facilities within the same organisation, when this could benefit them financially) or (2) when professionals are allowed to be shareholders (e.g.: would practitioners compromise on the level of professional advice provided to patients on the quality use of medicines, feeling financial pressure to 'up-sell' to consumers, for example by recommending medicines or products that may not be necessary for the patient)?**

Unlike doctors, pharmacists stressed that without regulation there would likely be more unethical behaviour, though they too underscored the pro-social behaviour of pharmacists, mentioning that it is possible to work in an ethical way also without any regulation, as helping people, in the view of pharmacists, is the reason why (most of the time) you choose this profession.

Four pharmacists stressed that there is a potential conflict of interest with regards to large insurance companies. In general, pharmacists mentioned that insurance companies have too much power, and they give financial incentives to pharmacists to use certain products, so they have to pay less for a patient (e.g. giving a patient a cheaper medicine). On the other side, pharmacists also mentioned that there are some ethical conflicts, between financials for the pharmacy to carry on, and the patient with his/her healthcare needs.

In the view of the interviewed pharmacists, these competing pressures, driven by market and by insurance companies (that want to lower prices), cannot be solved solely by regulation. Rather, in their opinion they should be addressed by making sure pharmacists have clear public policy goals and responsibilities. It is the difference between micro-managing the process and setting an overarching goal.

7. **More generally, do you think that the different forms of professional regulation (such as licensing, shareholding restrictions, advertising restrictions, tariff restrictions, etc…) have an effect on the practitioners' inclination to act in the public interest, including when this requires going against their own commercial interest or their client's desires?**

As in the case of doctors, pharmacists mentioned that regulation influences what is regarded as "normal" behaviour, providing some agreed-upon standards and a common framework within which to operate. While pharmacists agreed that this could help preventing some unethical behaviour, they also stated that regulation cannot go in-depth assessing every possible situation. At times however, in the view of interviewed pharmacists, there is an attempt to micro-manage their work through regulation. One pharmacist mentioned the

example of the Falsified Medicines Directive (*Directive 2011/62/EU*) as an example in this sense. The interviewee indicated that the Directive provides, in his view, limited added value in a situation (namely, his native country) where there are very few cases of falsified medicines reported.

Other pharmacists, especially from Italy, mentioned that clearly when there are some interests in play, and you can expect that behaviour may change when some regulation is missing (for instance, the example of vitamin supplements and similar products was cited, as a field which is not heavily regulated and in which there is wide leeway for choice and decision-making). So, broadly speaking, regulation, in the view of pharmacists, does have a positive role to play but should not be overly restrictive and detailed.

8. **Would introducing more competition have in your view any impact on the quality of medical services?**

Pharmacists agreed that they do not believe that more competition would automatically ensure better quality, with mixed effects being possible. First, according to one pharmacist, the current situation is already characterised by competition, which is already at a good level, stating that there is no need to increase it.

Second, on the one hand, interviewees mentioned that larger pharmacies – for which it would be easier to reduce costs compared to smaller pharmacies – could succeed in providing better care (more pharmacists, better time management, group culture and peer review, systematic and innovative management and business models).

On the other hand, more competition could take its toll on smaller pharmacists, which may struggle – as patients could prefer going to a larger and cheaper pharmacy even if this would further away from their home, instead of going to a more conveniently located but expensive pharmacy.

Several pharmacists also mentioned that the profession is, in their view, too important and delicate to have it boiled down to a race between price and quality

9. **How does professional regulation for practitioners in the medical / pharmaceutical professions help improve public interest goals, such as safety and public health?**

Practitioners mentioned that regulation concerning pharmacies is still quite different across MS, as different countries have different rules and standards. In the view of interviewed pharmacists, this may be a problem for people travelling across countries, with patients receiving uneven treatment. In general, only a couple of pharmacists mentioned the importance of regulation as a tool that may help achieve public interest goals: they indicated that regulation should be strict, and, like doctors, that it is very important to equip professionals with both a solid reference framework (e.g. professional boundaries) and recognition (e.g. provided by licensing).

3.3.4 Summary of key findings

Interviews provided useful insights on the spectrum of opinions of professionals regarding the topics covered by the study.

In general, interviewed doctors and pharmacists agreed on the **importance of licensing**, with some distinctions between them. Both professionals underscored that licensing is an important element that serves to recognise the expertise of professionals and the whole education and training process behind it. It is regarded as a "unifier" for the profession, making each professional feel part of a wider network. Apart from that, pharmacists seem to place more emphasis on the importance of licensing than doctors, making it a key part of their profession and status, even though it appears that younger generations may attribute less significance to it. Finally, interviewed doctors and pharmacists underscored that licensing can

have an "incentive" role, either as a necessary element to remain in the profession, or to communicate to the public a commitment to quality of care.

Licensing is not deemed to be causing a scarcity of practitioners in the field. Similarly, doctors do not consider obtaining the licence as complicated as the process of becoming a physician in the first place (from university studies onward).

Similar opinions are shared by doctors and pharmacists on the possibility to have some **routine tasks** performed by professionals with lower levels of training. While both categories approve it, pharmacists underlined how routine tasks should not be entirely outsourced to less trained professionals, as a pharmacist should always be involved at some point.

While interviewed doctors responded that being part of a **joint practice** is extremely important, influencing one's behaviours and creating motivation towards a common reputation, pharmacists were more inclined to say that peer review and exchange of practices are definitely important elements of their profession, but that working in joint practices would not necessarily influence their behaviour, and that professionals would behave in the same fashion whether acting alone or as a part of a group.

The **example of peers** nonetheless tends to influence professionals (with specific regard to some specialisations, such as surgery-related ones). The influence of peers tends to create some uniformity of behaviours (especially when it comes to joint practices), also helping to overcome some doubts or possible "*grey areas*" where codified behaviours and treatments may not be present.

A rather strong difference of opinions between interviewed doctors and pharmacists concerned the perceived importance of regulation as a tool to ensure **ethical behaviour**. Pharmacists generally agreed that the presence of the regulation is instrumental to avoid unethical behaviour, a position also shared by medical associations that were interviewed for this study. Doctors (practitioners) were more sceptical, underlining the innate pro-social behaviour of the profession. Both doctors and pharmacists could not rule out the presence of unethical behaviours notwithstanding the presence of clear regulations (e.g. against conflicts of interest), which, in their view, could not solve the issue on their own. Pharmacists, for instance, suggested to find a way to ensure professionals have clear public policy goals and responsibilities (setting an overarching goal rather than micro-managing through rules and regulations). Doctors agreed that the regulation does create a useful framework within which to work, defining common rules and elements to shape the profession and set clear limits, but without having, in their opinion, a strong effect when it comes to acting in the public interest.

Finally, mixed opinions were collected regarding **competition** and its effects on the profession. Interviewed doctors (both practitioners and associations) generally think that competition might lead to a "price war", with detrimental effects on the profession and the quality of care. Competition could also lead to further negative effects and perverse incentives, such as cutting costs by reducing investment in education and training of physicians on the part of hospitals, which would reduce quality of care. Similarly, pharmacists think that – while competition in their profession seems already to exist to a sufficient extent – competition would benefit large stores and chains, as for the latter it would be easier to contain costs and achieve economies of scale compared to small pharmacies.

However, both professions mentioned other, positive elements driven by competition. Interviewed doctors mentioned that if correctly designed, competition may be steered towards achieved high levels of quality of care, making hospitals and doctors to strive to be recognised as "the best" in the profession. Similarly, interviewed pharmacists mentioned that competition may help provide better care (with more pharmacists, better time management), increased group culture and peer review, as well as innovative management models.

3.4 Insights for the experimental design of the desk and field research

In general, looking at the results from the literature review and the interviews with professionals, it is evident that healthcare practitioners are strongly guided by their professional conscience and related aspects that are related to a professional ethos. Nonetheless, with a view towards increasing the efficiency and effectiveness of healthcare provision, it is important to establish through empirical research whether, and if so, in what ways, regulations impact the pro-social behaviour of health professionals (Pykett et al., 2017). Unfortunately, however, the evidence on the impact of professional regulation on the behaviour of healthcare professionals is still very limited (as also was concluded in the extensive review by Oliver, 2011). Few randomised controlled experimental studies have directly addressed the question: how does professional regulation affect the pro-social behaviour of those subject to regulation? Furthermore, the few studies addressing the question have either been based on limited number of unstructured interviews or related regulation to final outcomes, when the latter cannot be attributed entirely and only to professionals conducts via regulation.

The review of Sutherland and Leatherman (2006), for instance, concluded that there is little robust evidence concerning the impact licensure has on quality, but that there is a substantial body of evidence that indicates a positive association between specialist certification and better patient outcomes. According to Oliver (2011), the lack of evidence is explained by the difficulty to disentangle the combined effect of different forms of regulations and of other personal and non-regulatory factors, but also to some extent by the under-use of behavioural theory and methods. Indeed, it is extremely difficult to measure the impact of regulation, where regulation in healthcare is increasingly multi-layered and complex (Field, 2007).

When it comes to regulation, literature and interviews also showed interesting points of view concerning the role of competition. As reported by Frakt (2015), competition between hospitals can have a significant impact on care, decreasing length of stay and mortality rates, stimulating better management with lower staff turnover. In addition, Gaynor, Morena-Serra and Propper (2013) showed that competition had a positive correlation with reduction of the length of stay.

Many different factors of influence are interconnected with professional regulation, such as medical education (including the continuation of professional education), codes of conduct, practice guidelines, protocols, and checklists. Moreover, as Huising and Silbey (2011) stress, it is important to examine 'relational regulation'. It would be quite naïve to expect total compliance with regulations, also among health professionals, therefore it would be of great relevance to examine why some doctors comply to certain external incentives while others do not. Hence, the factors to disentangle are both general (continuous medical education, codes of conduct, practice guideline, protocols, checklists, clinical guidelines, professional regulation), and personal (motivation, age, gender, type of health professional, years of experience, professional leadership, employment contracts, personality). These have been taken into account as much as feasible in the experiment.

While there is a fair amount of evidence showing that healthcare professionals are more pro-socially and intrinsically motivated than professionals in some other domains, all health systems invest significant resources in professional regulation and quality assurance, thereby declining to leave quality up to the caring instincts of providers. Yet, providing empirical evidence on the causal effects of professional regulation on quality of care has proven difficult. Furthermore, a number of lessons can be drawn from the literature and field review; they informed the development of a number of hypotheses, which were tested in the experimental study. An important caveat to consider in this regard, however, relates to the fact that the **majority of the studies** were conducted either in Western countries, or only in developing countries, potentially creating a bias in their generalisability. The most important insights are:

1. In recent years an **increasing number of experimental studies** have been conducted in this area of research;
2. Studies have shown that it is important to differentiate between **payments by society or the patient**, because these influences the decision of the doctor in different ways;
3. Introducing the possibility that patients may reject the first treatment recommendation and **receive a second opinion** (at a positive cost) significantly reduces physicians' 'overtreatment';
4. Health workers consider **non-financial incentives and HRM tools** as useful ways to increase the motivation of health professionals;
5. **Sensitivity analyses** should be leveraged to account for general and personal factors and to establish which doctors are more susceptible to external incentives in delivering health services;
6. **Competition** (be it peer or market-driven competition) may have a positive effect on quality of care, and as such may be an untapped driver to help improve treatment.
7. **Peer pressure and group cooperation** are important elements for healthcare professionals, which can often lead to the creation of a standardised set of behaviours within the group (e.g. uniform decisions) and positive healthcare outcomes.

4 BEHAVIOURAL EXPERIMENT

The following chapter presents the results of the econometric and statistical analysis conducted in Spain and in the Netherlands. The description of the methodology and the experiment conditions are presented in Annex 3.

4.1 Results in Spain

In Spain, a total of 150 doctors and 150 subjects in the role of patients participated in the experiment. The Table 8 shows the distribution across experimental conditions of the sample. It is important to recall that the participants are the same in the two within-subject conditions (i.e. health system payment and private payment). The average payoff for doctors was 61.6 Euros (SD= 5.2 Euros), while for patients were 19.5 Euros (SD= 6.0 Euros) which includes a fixed participation fee of 4 Euros.

Table 8 - Sample distributions across experimental conditions, Spain

	Control	Market competition	Peer competition
Health system payment	50	52	48
Private payment	50	52	48

Source: Authors' elaboration.

Table 9 shows the descriptive statistics of the sociodemographic variables across experimental conditions for doctors. Overall, 31% of the sample were females and the average age was 51 years old. 73% of the sample was married and 35% is in a relationship with another doctor. On average, doctors got a medical degree 26 years ago. Almost the entire sample has a specialty (99%) and 90% have 10 or more years of experience working in the field of specialisation. Indeed, 79% of the sample has 10 or more years in the current job. Only 23% of the doctors have parents, grandparents, or siblings' that are also doctors. In the income relative position scale with respect to other doctors, the average position self-reported is 5.7 where 1 is the "worst paid" and 10 is the "best paid". Finally, in the income relative position scale with respect to the entire population, the average position self-reported is 6.5 where 1 is the "worst paid" and 10 is the "best paid".

Table 9 - Descriptive statistics, sociodemographic variables for doctors (mean and standard deviation)

Variable	Experimental conditions			
	Control	Market Competition	Peer Competition	Total
% Females	0.38	0.31	0.23	0.31
	(0.52)	(0.46)	(0.22)	(0.47)
Age	50	52	50	51
	(10.0)	(7.98)	(8.27)	(8.87)
% Married	0.66	0.77	0.77	0.73
	(0.47)	(0.42)	(0.42)	(0.44)

Variable	Experimental conditions			
	Control	Market Competition	Peer Competition	Total
% with partner doctor	0.3	0.29	0.48	0.35
	(0.45)	(0.45)	(0.50)	(0.47)
Years since the degree	25.3	27.8	26.4	26.6
	(9.79)	(8.66)	(8.61)	(9.09)
% who have a medical specialty	1	1	0.97	0.99
	0	0	(0.14)	(0.08)
% with 10 or more years working in the specialty field	0.84	0.94	0.93	0.90
	(0.36)	(0.23)	(0.24)	(0.29)
% with 10 or more years in the current job	0.68	0.84	0.85	0.79
	(0.46)	(0.36)	(0.35)	(0.40)
% with parents, grandparents, or siblings' doctors	0.22	0.21	0.27	0.23
	(0.41)	(0.40)	(0.44)	(0.42)
Income position with respect to other doctors [min=1: worst paid; max=10: best paid]	5.7	5.4	5.9	5.7
	(1.83)	(1.60)	(1.71)	(1.72)
Income position with respect to the entire population [min=1: worst paid; max=10: best paid]	6.5	6.3	6.8	6.5
	(1.68)	(1.91)	(1.29)	(1.67)

Note: Standard deviation in parenthesis.
Source: Authors' elaboration.

Table 10 shows the descriptive statistics of the prescription behaviour across experimental conditions for doctors. Overall, 91% answered "YES" to the question "Do you prescribe generic drugs?". 81% answered "YES" to the question "Have you ever read any article comparing the safety and efficacy of generic vs. brand-name drugs?", while 28% of the doctors answered "YES" to the question "Do you feel comfortable if pharmacists change a brand-name drug prescribed by you?". Finally, 30% of the doctors answered "YES" to the question "Do you prescribe brand-name drugs because their names are easier to memorize?".

Table 10 - Descriptive statistics, prescription behaviour (mean and standard deviation of % of doctors that answered YES)

Variable	Experimental conditions			
	Control	Market Competition	Peer Competition	Total
Do you prescribe generic drugs?	0.88	0.94	0.91	0.91

Variable	Experimental conditions			
	Control	Market Competition	Peer Competition	Total
	(0.32)	(0.23)	(0.27)	(0.28)
Have you ever read any article comparing the safety and efficacy of generic vs. brand-name drugs?	0.84	0.82	0.77	0.81
	(0.36)	(0.37)	(0.42)	(0.38)
Do you feel comfortable if pharmacists change a brand-name drug prescribed by you?	0.3	0.19	0.38	0.28
	(0.45)	(0.39)	(0.48)	(0.45)
Do you prescribe brand-name drugs because their names are easier to memorize?	0.3	0.25	0.38	0.30
	(0.45)	(0.43)	(0.48)	(0.46)

Note: Standard deviation in parenthesis.
Source: Authors' elaboration.

Table 11 shows the answers to the questions regarding beliefs and feelings about generic drugs in the doctors of the entire sample. As is shown in Table 11, in most of the statements there seem to be a consensus between the doctors that participate in the experiment. In fact, in all the statements either more than 50% of the doctors disagree with the statement (e.g. completely disagree or partially disagree) or more than 50% of the doctors agree with the statement (e.g. partially agree or completely agree).

In particular, 73.3% of the doctors disagree with the statement "Generic drugs are cheaper because they are less efficacious". In contrast, 84.7% of the doctors agree with the statement "Generic drugs are used to treat the same diseases". 70.0% of the doctors agree with the statement "Generic drugs have a different package than brand-name drugs". Also, 90.0% disagree with the statement "Generic drugs are purely herbal products and do not contain any chemical agents". 88.7% of the doctors disagree with the statement "Unlike brand-name drugs, generic drugs are produced naturally". 79.4% of doctors disagree with the statement "Generic drugs are good for less severe diseases". In the same way, 73.3% of doctors disagree with the statement "Generic drugs are made with lower quality substances". 73.3% of doctors disagree with the statement "Generic drugs are as effective as brand-name drugs". 72.7% of doctors agree with the statement "Generic drugs have the same effect as brand-name drugs". 70.0% of doctors disagree with the statement "Treatments with generic drugs take longer". 72.7% of doctors disagree with the statement "Generic drugs take longer to be efficacious". 80.6% of doctors disagree with the statement "Frequently, it is necessary to take twice the amount of the active ingredient of the generic drug to have the same effect as the brand-name drug". 74.7% of doctors disagree with the statement "Compared with brand-name drugs, generic drugs have been in the market for a shorter time period, so they have more risks and side effects". 72.0% of doctors disagree with the statement "Generic antibiotics are less efficacious than brand-name antibiotics". 62.0% of doctors disagree with the statement "Doctors who can dispense medications directly to their patients do not dispense generic drugs". On the other hand, 72.0% of doctors agree with the statement "The active ingredients of generic drugs have the same side effects than the active ingredients of brand-name drugs". 75.3% of doctors agree with the statement "Generic drug manufacturers spend less money in research for the development of their drugs". 68.6% of doctors disagree with the statement "Generic drugs have better quality control than brand-name drugs". 62.0% of doctors agree

with the statement "Generic contraceptives are as safe as brand-name contraceptives". 52.6% of doctors agree with the statement "Generic drugs may contain different inactive ingredients than brand-name drugs". Finally, 60.0% of doctors disagree with the statement "Generic drug manufacturers and brand-name drug manufacturers spend the same amount of money for patent protection".

Table 11 - Beliefs and feelings about generic drugs

Statement	Completely disagree	Partially disagree	I am not sure	Partially agree	Completely agree	Total
Generic drugs are cheaper because they are less efficacious	50.0%	23.3%	7.3%	17.3%	2.0%	100%
Generic drugs are used to treat the same diseases	4.7%	5.3%	5.3%	24.0%	60.7%	100%
Generic drugs have a different package than brand-name drugs	4.7%	12.0%	13.3%	21.3%	48.7%	100%
Generic drugs are purely herbal products and do not contain any chemical agents	82.0%	8.0%	6.0%	2.7%	1.3%	100%
Unlike brand-name drugs, generic drugs are produced naturally	82.7%	6.0%	7.3%	2.7%	1.3%	100%
Generic drugs are good for less severe diseases	56.7%	22.7%	8.0%	9.3%	3.3%	100%
Generic drugs are made with lower quality substances	54.0%	19.3%	12.7%	12.0%	2.0%	100%
Generic drugs are as effective as brand-name drugs	5.3%	14.7%	5.3%	38.0%	36.7%	100%
Generic drugs have the same effect as brand-name drugs	6.7%	12.7%	8.0%	34.7%	38.0%	100%
Treatments with generic drugs take longer	50.0%	20.0%	16.0%	12.7%	1.3%	100%
Generic drugs take longer to be efficacious	50.7%	22.0%	8.7%	16.7%	2.0%	100%

Statement	Completely disagree	Partially disagree	I am not sure	Partially agree	Completely agree	Total
Frequently, it is necessary to take twice the amount of the active ingredient of the generic drug to have the same effect as the brand-name drug	61.3%	19.3%	8.0%	10.0%	1.3%	100%
Compared with brand-name drugs, generic drugs have been in the market for a shorter time period, so they have more risks and side effects	50.7%	24.0%	11.3%	8.7%	5.3%	100%
Generic antibiotics are less efficacious than brand-name antibiotics	52.0%	20.0%	10.0%	13.3%	4.7%	100%
Doctors who can dispense medications directly to their patients do not dispense generic drugs	36.7%	25.3%	14.0%	18.7%	5.3%	100%
The active ingredients of generic drugs have the same side effects than the active ingredients of brand-name drugs	9.3%	8.0%	10.7%	26.0%	46.0%	100%
Generic drug manufacturers spend less money in research for the development of their drugs	8.0%	8.7%	8.0%	27.3%	48.0%	100%
Generic drugs have better quality control than brand-name drugs	41.3%	27.3%	18.7%	10.0%	2.7%	100%
Generic contraceptives are as safe as brand-name contraceptives	7.3%	8.7%	22.0%	21.3%	40.7%	100%

Statement	Completely disagree	Partially disagree	I am not sure	Partially agree	Completely agree	Total
Generic drugs may contain different inactive ingredients than brand-name drugs	15.3%	7.3%	24.7%	31.3%	21.3%	100%
Generic drug manufacturers and brand-name drug manufacturers spend the same amount of money for patent protection	36.0%	24.0%	25.3%	20.7%	4.0%	100%

Source: Authors' elaboration.

Table 12 shows the descriptive statistics of the individual preferences across experimental conditions for doctors. In particular, this table presents the results for risk aversion, financial risk aversion, time preference, inequality aversion, political participation, reciprocity, and altruism. For risk aversion, the average number selected on a scale from 1 [Completely unwilling to take risks] to 5 [Completely willing to take risks] was 3.2, while for financial risk aversion the number was 2.6. This clearly shows that doctors in the sample are more risk averse in financial activities with respect to other activities. For time preferences, the average number selected on a scale from 1 [Completely unwilling to give up something today] to 5 [Completely willing to give up something today] was 3.6. For inequality aversion, the average number selected on a scale from 1 [Completely unwilling to incur costs to punish unfair behaviours] to 5 [Very willing to incur costs to punish unfair behaviours] was 3.4. Regarding political participation, 60% of the doctors vote every time when there are elections. Doctors were willing to reciprocate at a cost of two third of the maximum. Finally, as a measure of altruism, on average, doctors were willing to donate 12.0% of the prize of a 10,000 Euros lottery to charity.

Table 12 - Descriptive statistics, preferences (average and standard deviation)

Variable	Experimental conditions			
	Control	Market Competition	Peer Competition	Total
Risk aversion [min=1: Completely unwilling to take risks; max=5: Completely willing to take risks]	3.2	3.2	3.3	3.2
	(0.85)	(0.98)	(0.90)	(0.91)
Financial risk aversion [min=1: Completely unwilling to take financial risks; max=5: Completely willing to take financial risks]	2.6	2.6	2.6	2.6
	(1.03)	(1.02)	(1.05)	(1.03)
Time preference [min=1: Completely unwilling to give up something today; max=5:	3.6	3.7	3.4	3.6

Variable	Experimental conditions			
	Control	Market Competition	Peer Competition	Total
Completely willing to give up something today]				
	(0.91)	(0.80)	(1.02)	(0.92)
Inequality aversion [min=1: Completely unwilling to incur costs to punish unfair behaviours; max=5: Very willing to incur costs to punish unfair behaviours]	3.5	3.4	3.4	3.4
	(0.78)	(0.96)	(0.85)	(0.87)
% of participation in political elections (vote every time)	0.6	0.7	0.5	0.6
	(0.49)	(0.46)	(0.49)	(0.48)
Reciprocity [min= 5-euro bottle; max= 30-euro bottle]	21.6	22.2	21.6	21.8
	(7.18)	(6.24)	(7.8)	(7.10)
Altruism [Share of a EUR 10,000 lottery willing to donate to charity]	10.6	12.7	12.7	12.0
	(10.10)	(12.60)	(17.07)	(13.52)

Note: Standard deviation in parenthesis.
Source: Authors' elaboration.

Table 13 shows the descriptive statistics of the entrepreneurship preferences across experimental conditions for doctors. First, 30% of the doctors answered "YES" to the question "Have you ever been self-employed (self-employed or entrepreneur)?". Secondly, 20% of the doctors answered "YES" to the question "Have you ever seriously considered becoming an entrepreneur?". In the statement "I am willing to do whatever it takes to be an entrepreneur", the average number selected on a scale from 1 [Total disagreement] to 7 [Full agreement] was 2.5. However, in the statement "My professional goal is to become an entrepreneur", the average number selected on a scale from 1 [Total disagreement] to 7 [Full agreement] was 2.3. When we look at the statement "I will endeavour to create and run my own business", the average number selected on a scale from 1 [Total disagreement] to 7 [Full agreement] was 2.6. The same average number is found in the statements "I am determined to create a company in the future" and "I have thought very seriously about creating a company". Finally, in the statement "I have the firm intention of starting a company one day", the average number selected on a scale from 1 [Total disagreement] to 7 [Full agreement] was 2.5.

Table 13 - Descriptive statistics, entrepreneurship (average and standard deviation)

Variable	Experimental conditions			
	Control	Market Competition	Peer Competition	Total
Have you ever been self-employed (self-employed or entrepreneur)? [Share of % of doctors that answered YES]	0.4	0.3	0.3	0.3

Variable	Experimental conditions			
	Control	Market Competition	Peer Competition	Total
	(0.49)	(0.46)	(0.44)	(0.46)
Have you ever seriously considered becoming an entrepreneur? [Share of % of doctors that answered YES]	0.3	0.2	0.3	0.2
	(0.44)	(0.40)	(0.44)	(0.43)
I am willing to do whatever it takes to be an entrepreneur [min=1: Total disagreement; max=7: Full agreement]	2.5	2.3	2.7	2.5
	(1.56)	(1.40)	(1.63)	(1.5)
My professional goal is to become an entrepreneur [min=1: Total disagreement; max=7: Full agreement]	2.3	2.1	2.4	2.3
	(1.49)	(1.25)	(1.51)	(1.42)
I will endeavour to create and run my own business [min=1: Total disagreement; max=7: Full agreement]	2.5	2.4	2.7	2.6
	(1.55)	(1.70)	(1.78)	(1.68)
I am determined to create a company in the future [min=1: Total disagreement; max=7: Full agreement]	2.6	2.5	2.6	2.6
	(1.70)	(1.70)	(1.78)	(1.72)
I have thought very seriously about creating a company [min=1: Total disagreement; max=7: Full agreement]	2.6	2.5	2.6	2.6
	(1.80)	(1.71)	(1.83)	(1.78)
I have the firm intention of starting a company one day [min=1: Total disagreement; max=7: Full agreement]	2.6	2.4	2.5	2.5
	(1.74)	(1.72)	(1.75)	(1.74)

Note: Standard deviation in parenthesis.
Source: Authors' elaboration.

4.1.1 Finally, we tested the balance in the covariates between experimental conditions with an F-test[35]. The F-test showed differences in all the covariates across experimental conditions. These results suggest that in order to have a correct specification of the estimation of the causal

[35] To do this we run a multinomial logit estimation with the treatment variable as the dependent variable and the covariates as independent variables. Then, we performed an F-Test to verify if there is any difference in all the covariates between conditions. We run a test for all the sets of covariates presented in this section. For demographics (chi2=108.33, p-value=0.0000), preferences (chi2=72.32, p-value=0.0002), prescription behaviour (chi2=47.22, p-value=0.0005), Entrepreneurship preferences (chi2=19.87, p-value=0.0305), and overall (chi2=28.79, p-value=0.0013).

effects in our model through comparable groups, it is necessary to introduce the observable variables as covariates in the estimation.

Causal impact of experimental conditions on outcome variables

In this section, we will show the results of the estimation of the models presented in Annex 3 and 4. First, we present the results and analysis for the model stated in Equation [1][36] to identify the treatment effects and then we present the results and analysis for the model stated in Equation [2][37] to identify the main effects of the experimental conditions. It is important to clarify the difference in the interpretation between the two models. The model stated in Equation [1] estimates the treatment effect of each experimental condition. For example, in this model it is possible to identify the treatment effect of market or peer competition under private payment scheme, but also under health system payment. It is also possible to identify the effect of being under private payment in the control condition, market or peer competition. In sum, in this model it is possible to separate and compare all the treatment groups. On the other hand, the second model estimates the main effect of the experimental condition. In this case, the comparison includes all the groups at the same time, for instance, the main effect of market competition compares all the subjects under this condition (i.e. under private payment and under health system payment) with respect to control condition which includes all the subject under this condition too (i.e. under private payment and under health system payment).

The analysis is divided into two groups of outcome variables, namely: Productivity and Quality of service. The former includes the time spent in solving the medical case in seconds, the probability of getting the high bonus, and the probability of getting at least one bonus, while the latter includes the probability of getting a correct diagnosis, the probability of getting a correct prescription and, the probability of prescribing a generic drug. Prescribing a generic drug instead of a brand-name drug could be interpreted as a prosocial attitude in the sense that doctors internalize the effects of their decision-making on the well-being of the patient, since patients can pay for the medical prescription (Hellerstein, 1988).

Table 14 shows the descriptive statistics for the outcome variables, we include the mean and the standard deviation in parenthesis. The table presents the results by experimental conditions and the overall output for the total sample. As shown in the table, the time spent in solving the cases shows wide values for the standard deviation; these values exhibit a broad measure of spread, a behaviour that is generally observed in time variables.

Table 14 Descriptive statistics for outcomes variables, Spain

Experimental condition	Outcome variables					
	Productivity			Quality of service		
	Time spent in solving the case (seconds)	Probability of getting the high bonus	Probability of getting at least one bonus	Probability of getting a correct diagnosis	Probability of getting a correct prescription	Probability of prescribing a generic drug
Control	87.06	0.86	0.93	0.49	0.41	0.86

[36] $Y_i = \beta_0 + \beta_1 Market\ Competition_i + \beta_2 Peer\ Competition_i + \beta_3 Private\ payment_i + \beta_4 Private\ payment_i * Market\ Competition_i + \beta_4 Private\ payment_i * Peer\ Competition_i + X_i\gamma + \varepsilon_i$

[37] $Y_i = \delta_0 + \delta_1 Market\ Competition_i + \delta_2 Peer\ Competition_i + \delta_3 Private\ payment_i + X_i\gamma + \varepsilon_i$

Experimental condition		Outcome variables					
		Productivity			Quality of service		
		Time spent in solving the case (seconds)	Probability of getting the high bonus	Probability of getting at least one bonus	Probability of getting a correct diagnosis	Probability of getting a correct prescription	Probability of prescribing a generic drug
	Private	(114.4)	(0.34)	(0.25)	(0.50)	(0.49)	(0.35)
	Health system	96.59	0.79	0.92	0.52	0.33	0.81
		(114.23)	(0.41)	(0.28)	(0.50)	(0.47)	(0.39)
Market competition	Private	95.23	0.76	0.91	0.47	0.42	0.87
		(80.11)	(0.42)	(0.29)	(0.50)	(0.50)	(0.34)
	Health system	125.21	0.65	0.87	0.53	0.48	0.89
		(102.90)	(0.48)	(0.34)	(0.50)	(0.50)	(0.31)
Peer competition	Private	70.80	0.87	0.95	0.40	0.40	0.84
		(46.71)	(0.33)	(0.22)	(0.49)	(0.49)	(0.36)
	Health system	92.42	0.71	0.93	0.47	0.36	0.85
		(64.70)	(0.46)	(0.25	(0.50)	(0.48)	(0.36)
Overall		94.93	0.78	0.92	0.48	0.4	0.85
		(92.43)	(0.42)	(0.27)	(0.50)	(0.49)	(0.35)

Source: Authors' elaboration.

Productivity

We have three measures of doctor's productivity in the experiment: time spent in solving the case, likelihood of getting the high bonus, and likelihood of getting at least one bonus. The choice of measures mainly stems from the fact that productivity/performance is a latent construct, not directly observed but rather inferred from other variables, therefore using more than one proxy is a sensible choice for a robust estimation. In addition, the two measures can be (and are) ranked, allowing for an easier interpretation of productivity.

Impact of the experimental conditions on the time spent in solving the case

To capture the impact of the experimental conditions on the on time spent in solving the case of the doctors in the experiment, we report two tables. Table 15 shows the results of the

estimation of the model. The second table, Table 16, shows the main effect of the experimental conditions.

The outcome variable, time spent in solving the case, captures the time in seconds that each doctor spends in solving the medical case (including both diagnosis and prescription). Since this variable has several outliers that could affect seriously the estimation of the actual impact, we correct the estimation for outliers. To handle this, we identified the extreme values between the observations in each treatment group, in particular, the five lowest values and the five highest values following the method used by Cox (2017). Notice that the results include different sets of covariates as controls such as demographics variables, preferences, prescription behaviour, and entrepreneurship preferences. The results also include a dummy variable to control for order effects for within-subject conditions. The last column in the table shows the result of the estimation with all the control variables.

The complete regression can be found in Annex 3.

Table 15 - Treatment effects on the time spent in solving the case

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	28.62*	25.24	27.71*	28.96*	28.62*	27.06*
	(16.66)	(15.79)	(16.40)	(16.67)	(16.66)	(15.88)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	8.17	4.79	7.26	8.51	8.16	6.61
	(15.10)	(14.82)	(14.58)	(15.84)	(14.94)	(14.26)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	-4.16	-2.79	-2.42	-1.28	-2.33	3.72
	(14.83)	(13.99)	(14.28)	(14.39)	(15.12)	(14.05)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-16.26	-14.88	-14.51	-13.37	-14.42	-8.38
	(12.57)	(12.01)	(12.57)	(12.22)	(12.87)	(11.80)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system})$	-9.53	-9.53	-9.53	-9.53	-9.53	-9.53
	(14.85)	(14.95)	(14.92)	(14.89)	(14.87)	(15.06)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system})$	-29.97***	-29.97***	-29.97***	-29.97***	-29.98***	-29.97***
	(8.36)	(8.36)	(8.41)	(8.38)	(8.37)	(8.48)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system})$	-21.62***	-21.62***	-21.62***	-21.62***	-21.62***	-21.62***
	(7.03)	(7.01)	(7.06)	(7.05)	(7.03)	(7.11)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}))$	-20.45	-20.45	-20.45	-20.45	-20.45	-20.45
	(17.04)	(17.16)	(17.12)	(17.09)	(17.07)	(17.28)
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}))$	-12.09	-12.09	-12.09	-12.09	-12.09	-12.09
	(16.42)	(16.54)	(16.50)	(16.47)	(16.45)	(16.66)
Constant	96.59***	-31.78	88.68***	147.13***	98.66***	-93.19
	(12.47)	(79.82)	(28.57)	(26.30)	(16.82)	(96.78)
COVARIATES						
Demographics	NO	YES	NO	NO	NO	YES
Preferences	NO	NO	YES	NO	NO	YES
Prescription behaviour	NO	NO	NO	YES	NO	YES
Entrepreneurship preferences	NO	NO	NO	NO	YES	YES
Order effect	NO	YES	YES	YES	YES	YES
Observations	900	900	900	900	900	900
Number of id	150	150	150	150	150	150
Individual random effects	YES	YES	YES	YES	YES	YES

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

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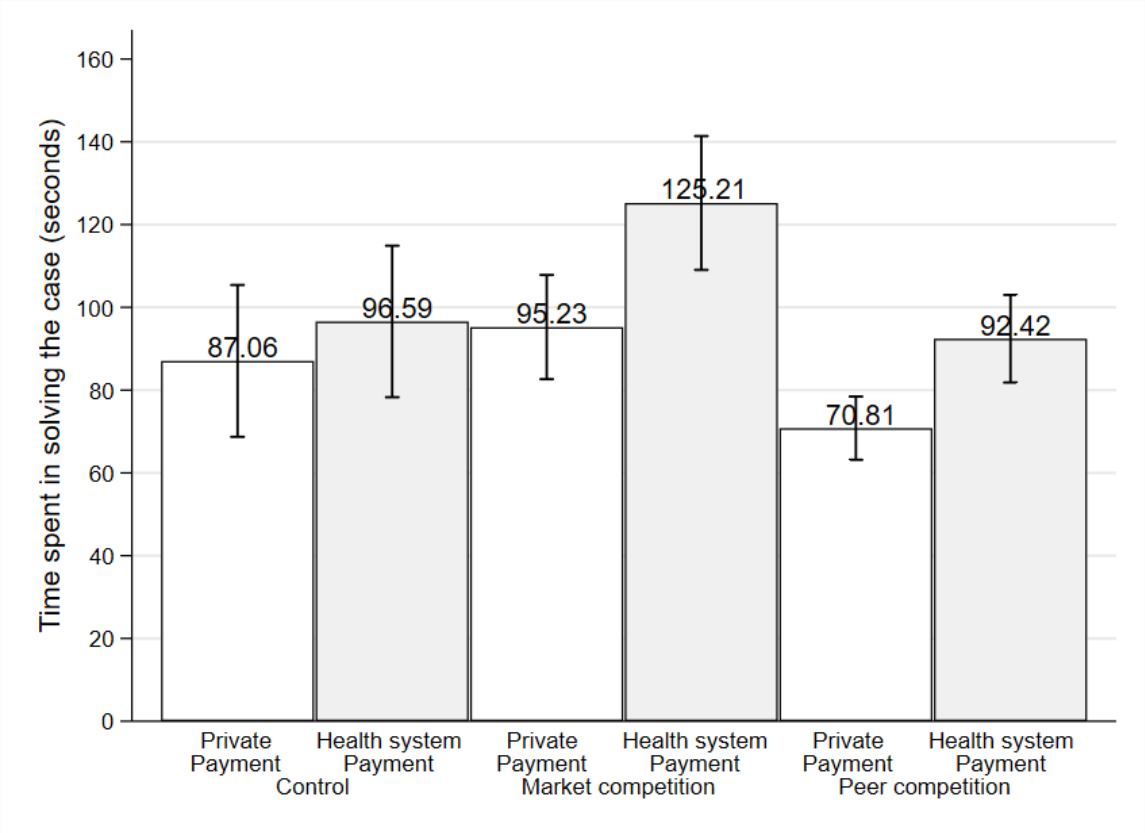
Source: Authors' elaboration

The average value of the time spent in solving the case in the control and health system payment conditions is 96.59 seconds. As shown in Table 15 and Figure 6, market competition increases the time spent in solving the medical case by 27 seconds with respect to control condition under health system payment scheme. Being under private payment scheme reduces the time spent in solving the case by 29 seconds under market competition and by 21 seconds under peer competition with respect to health system payment scheme.

Figure 6 - Treatment effects on the time spent in solving the case



Source: Authors' elaboration.

The main effect of private payment scheme is -20 seconds[38]. This is, being under private payment scheme reduces by 20 seconds the time spent in solving the medical case with respect to being under the health payment scheme. Notice that the interpretation of this result, unlike the one presented in the treatment effects model above, is that the comparison with the health system payment scheme includes the three between-subject experimental conditions (i.e. control, market competition, peer competition), not only the market or the peer competition. In addition, being under peer competition reduces the time spent in solving the medical case in 28 seconds with respect to market competition. These results are shown in Figure 7.

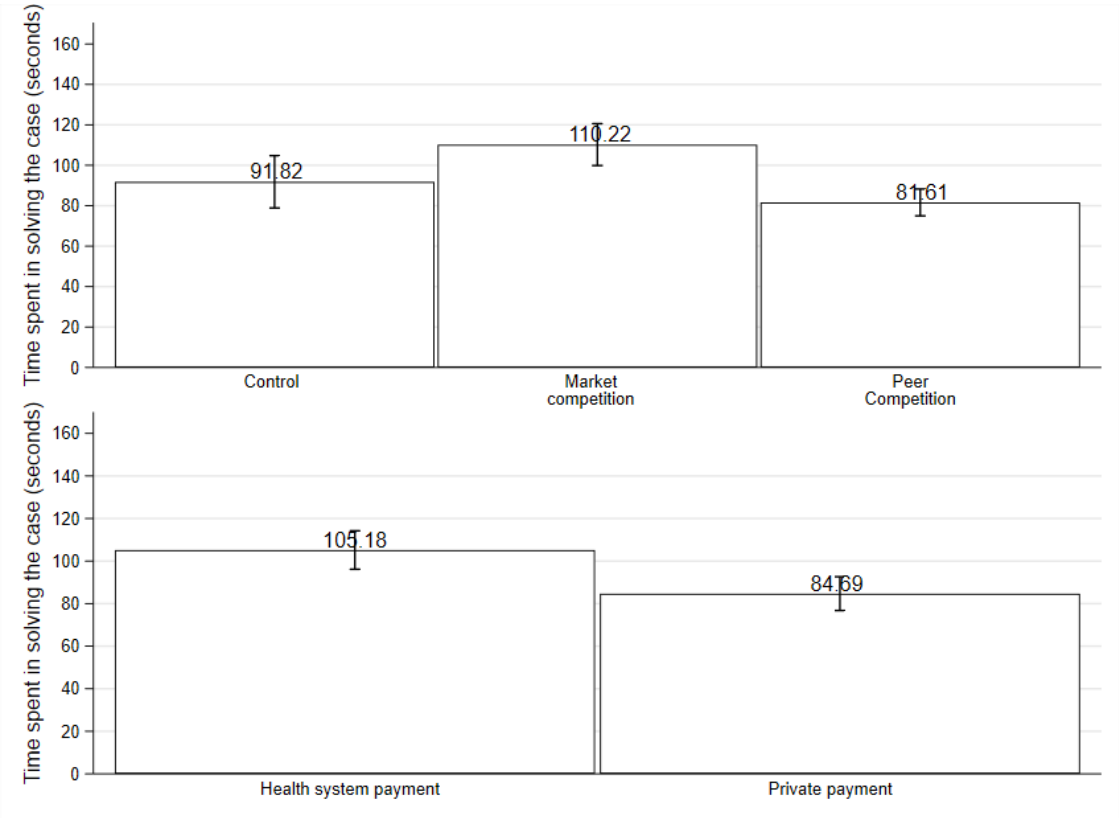
[38] Caveat: Although cases are expected to be well-balanced between within-subject conditions (i.e., private and health system schemes), the within-subject effect could potentially be influenced by differences in the level of difficulty in the medical cases. With the actual design it is not possible to identify if the effect is driven by treatment effect or by the level of difficulty.

Table 16 - Main effect on time spent in solving the case

Experimental condition	Main effect on time spent in solving the case					
	(1)	(2)	(3)	(4)	(5)	(6)
Between-subject conditions						
Market competition	18.39	15.01	17.49	18.74	18.39	16.84
	(13.40)	(12.68)	(12.93)	(13.82)	(13.32)	(12.36)
Peer competition	-10.34	-8.83	-8.47	-7.33	-8.38	-2.33
	(11.01)	(10.07)	(10.62)	(10.50)	(11.36)	(9.94)
Within-subject condition						
Private payment	-20.49***	-20.49***	-20.49***	-20.49***	-20.49***	-20.49***
	(6.20)	(6.23)	(6.22)	(6.21)	(6.20)	(6.28)
Note: for the between-subject conditions the comparison is with respect to the control experimental condition. On the other hand, for the within-subject experimental condition the comparison is with respect to the health system payment condition.						

Source: Authors' elaboration

Figure 7 - Main treatment effects on the time spent in solving the case



Source: Authors' elaboration.

Impact of the experimental conditions on the likelihood of getting the high bonus

The outcome variable is the likelihood of getting the high bonus for productivity in the experiment. This is a dummy variable that has the value of 1 if the doctor wins the high bonus for productivity (i.e. if resolved the medical case in less than 2 minutes), otherwise, the value is 0. To capture the impact of the experimental conditions on the likelihood of getting the high bonus by doctors in the experiment, we report two tables. Table 17 shows the results of the estimation of the model with interactions and Table 18 shows the model with the main effects of the experimental conditions.

Notice that the results include different sets of covariates as controls such as demographics variables, preferences, prescription behaviour, and entrepreneurship preferences. The results also include a dummy variable to control for order effects for within-subject conditions. The last column in the table shows the result of the estimation with all the control variables.

Table 17 - Treatment effect on likelihood of getting the high bonus

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	-0.14**	-0.13*	-0.13**	-0.14**	-0.14**	-0.14**
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.06)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	-0.10*	-0.09	-0.09	-0.10*	-0.10*	-0.10*
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	-0.08	-0.08	-0.08	-0.09	-0.09	-0.10
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-0.00	-0.00	-0.00	-0.00	-0.00	-0.02
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system})$	0.07*	0.07*	0.07*	0.07*	0.07*	0.07*
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system})$	0.12**	0.12**	0.12**	0.12**	0.12**	0.12**
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system})$	0.16***	0.16***	0.16***	0.16***	0.16***	0.16***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}))$	0.04	0.04	0.04	0.04	0.04	0.04
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}))$	0.09	0.09	0.09	0.09	0.09	0.09
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Constant	0.79***	1.28***	0.81***	0.55***	0.79***	1.51***
	(0.05)	(0.27)	(0.13)	(0.11)	(0.06)	(0.41)
COVARIATES						
Demographics	NO	YES	NO	NO	NO	YES
Preferences	NO	NO	YES	NO	NO	YES
Prescription behaviour	NO	NO	NO	YES	NO	YES
Entrepreneurship preferences	NO	NO	NO	NO	YES	YES
Order effect	NO	YES	YES	YES	YES	YES
Observations	900	900	900	900	900	900
Number of id	150	150	150	150	150	150
Individual random effects	YES	YES	YES	YES	YES	YES

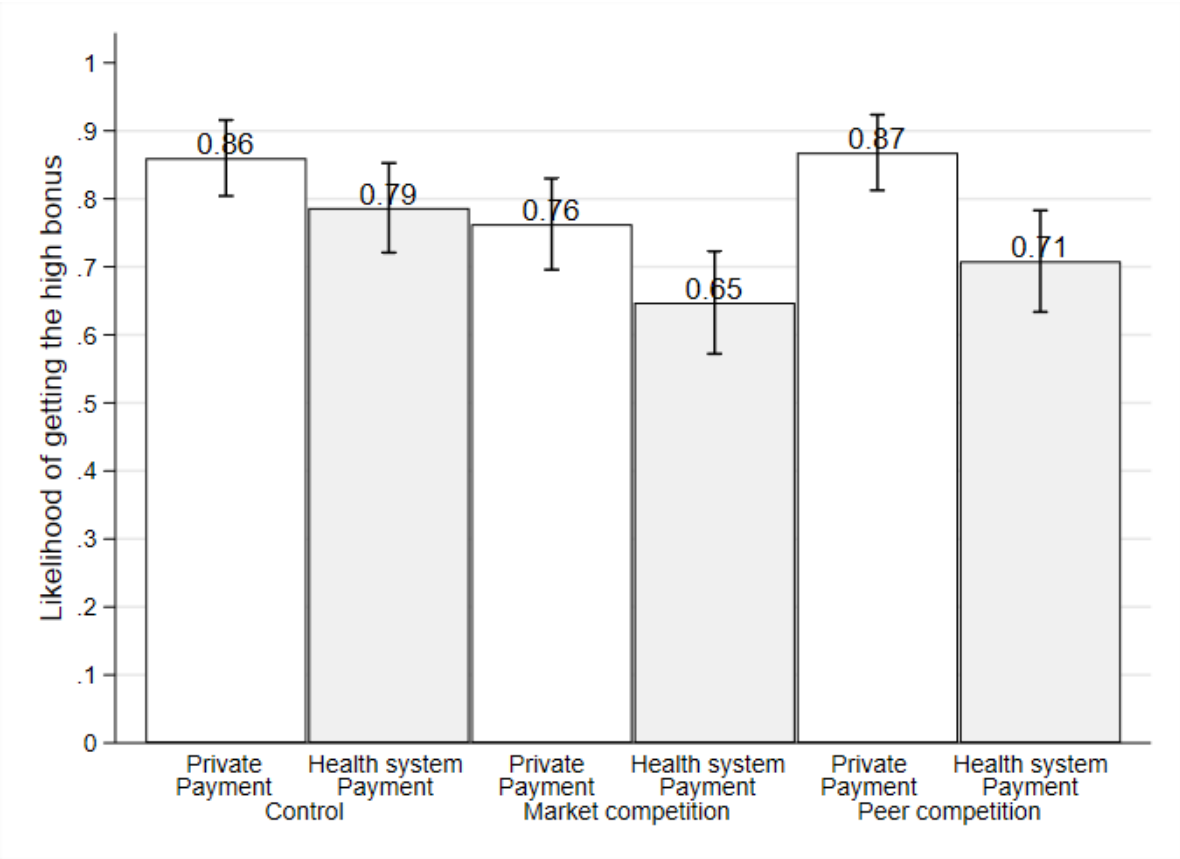
Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

The complete regression could be found in the annex.

Source: Authors' elaboration.

The average value of the likelihood of getting the high bonus in the control and health system payment conditions is 79%. Table 17 and Figure 8 show the following results. **Market competition reduces the probability of getting the high bonus by 14% with respect to control condition under health system payment scheme and 10% under private payment scheme**. Being under the private payment scheme increases the likelihood of getting the high bonus by 7% with respect to being under the health system payment scheme in the control condition. In the same direction, private payment scheme increases the likelihood of getting the high bonus by 12% with respect to being under health system payment in the market competition and by 16% in the peer competition.

Figure 8 - Treatment effect on likelihood of getting the high bonus



Source: Authors' elaboration.

The main effect of market competition is -12%. In fact, market competition reduces the likelihood of getting the high bonus by 12% with respect to the control condition. Indeed, market competition also reduces by 8% the probability of getting the high bonus with respect to peer competition. **Private payment scheme has a main effect of 12%[39].** This means, that being under private payment scheme increases the probability of getting the high bonus by 12% with respect to health system payment scheme. The interpretation of this result, unlike the one presented in the treatment effects model above, is that the comparison with the health system payment scheme includes the three between-subject experimental conditions (i.e. control, market competition, peer competition), not only the control condition. These results are also shown in Figure 9.

[39] Caveat: Although cases are expected to be well-balanced between within-subject conditions (i.e., private and health system schemes), the within-subject effect could potentially be influenced by differences in the level of difficulty in the medical cases. With the actual design it is not possible to identify if the effect is driven by treatment effect or by the level of difficulty.

These findings are in line with those observed with the time variable in the previous section: market competition reduces the likelihood of getting the high bonus through a rise on the time spent in solving the medical case. In addition, private competition increases the likelihood of getting the high bonus through a reduction on the time spent in solving the medical case.

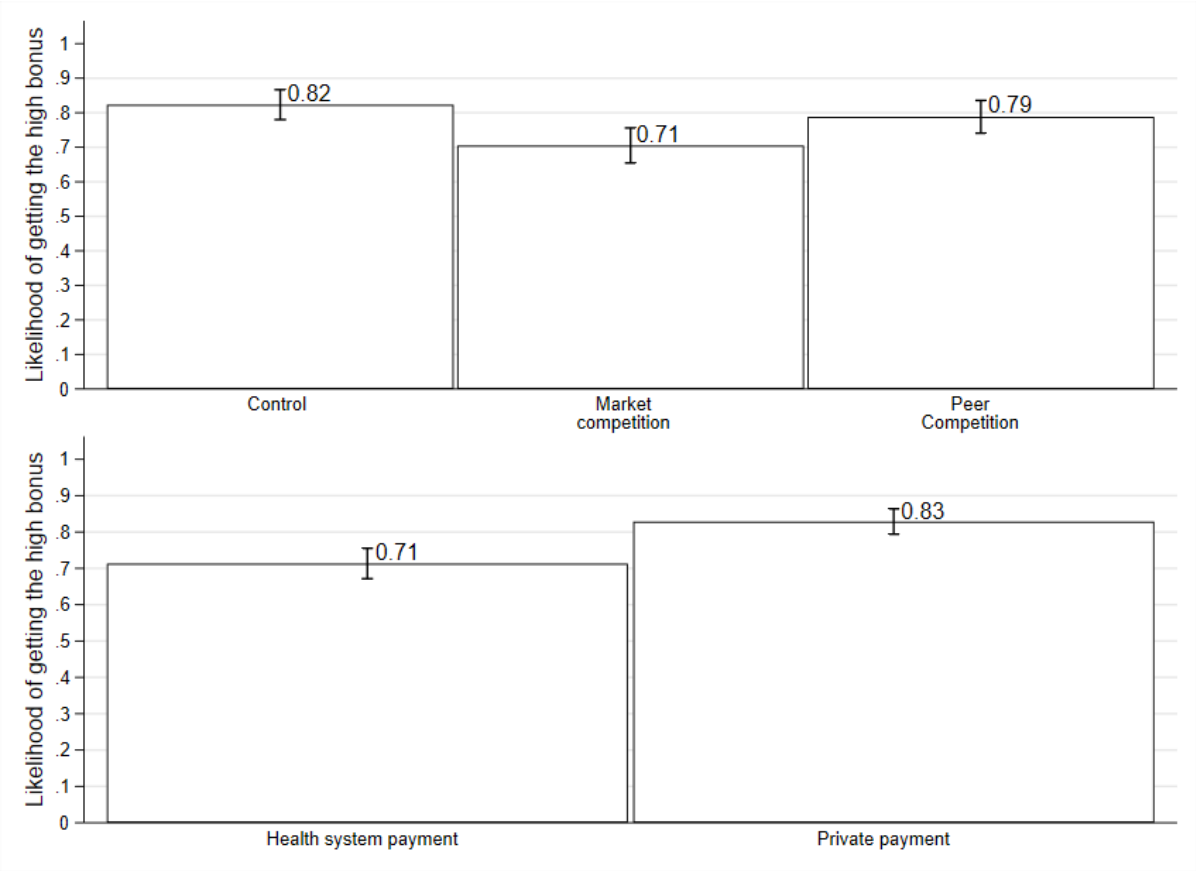
Table 18 - Main effect on likelihood of getting the high bonus

Experimental condition	Main effect on likelihood of getting the high bonus					
	(1)	(2)	(3)	(4)	(5)	(6)
Between-subject conditions						
Market competition	-0.12**	-0.11*	-0.11**	-0.12**	-0.12**	-0.12**
	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)
Peer competition	-0.04	-0.04	-0.04	-0.05	-0.05	-0.06
	(0.05)	(0.05)	(0.05)	(0.05)	(0.06)	(0.05)
Within-subject condition						
Private payment	0.12***	0.12***	0.12***	0.12***	0.12***	0.12***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)

Note: for the between-subject conditions the comparison is with respect to the control experimental condition. On the other hand, for the within-subject experimental condition the comparison is with respect to the health system payment condition.

Source: Authors' elaboration

Figure 9 - Main effects on likelihood of getting the high bonus



Source: Authors' elaboration.

Impact of the experimental conditions on the likelihood of getting at least one bonus

The outcome variable is the likelihood of getting at least one bonus for productivity in the experiment. This is a dummy variable that has the value of 1 if the doctor wins the low bonus for productivity (i.e. if resolved the medical case between 2-4 minutes) or wins the high bonus for productivity (i.e. if resolved the medical case in less than 2 minutes), otherwise, the value is 0. To capture the impact of the experimental conditions on the likelihood of getting at least one bonus by doctors in the experiment, we report two tables. Table 19 shows the results of the estimation of the model with interactions and Table 20 shows the model with the main effects of the experimental conditions.

Notice that the results include different sets of covariates as controls such as demographics variables, preferences, prescription behaviour, and entrepreneurship preferences. The results also include a dummy variable to control for order effects for within-subject conditions. The last column in the table shows the result of the estimation with all the control variables.

Table 19 - Treatment effect on likelihood of getting at least one bonus

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	-0.04	-0.03	-0.04	-0.04	-0.04	-0.04
	(0.05)	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	0.02	0.01	0.02	0.01	0.01	-0.00
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	0.02	0.01	0.02	0.01	0.01	-0.00
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system})$	0.02	0.02	0.02	0.02	0.02	0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system})$	0.04	0.04	0.04	0.04	0.04	0.04
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system})$	0.02	0.02	0.02	0.02	0.02	0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}))$	0.02	0.02	0.02	0.02	0.02	0.02
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}))$	0.00	0.00	0.00	0.00	0.00	0.00

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Constant	0.91***	1.20***	0.87***	0.80***	0.92***	1.24***
	(0.03)	(0.19)	(0.07)	(0.08)	(0.04)	(0.27)
COVARIATES						
Demographics	NO	YES	NO	NO	NO	YES
Preferences	NO	NO	YES	NO	NO	YES
Prescription behaviour	NO	NO	NO	YES	NO	YES
Entrepreneurship preferences	NO	NO	NO	NO	YES	YES
Order effect	NO	YES	YES	YES	YES	YES
Observations	900	900	900	900	900	900
Number of id	150	150	150	150	150	150
Individual random effects	YES	YES	YES	YES	YES	YES
Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. The complete regression could be found in the annex.						

Source: Authors' elaboration.

The average value of the likelihood of getting at least one bonus in the control and health system payment conditions is 91%. Table 19 shows that **there is no significant statistical effect of the treatments on the likelihood of getting at least one bonus.**

There is no significant statistical main effect of the experimental conditions on the likelihood of getting at least one bonus.

Table 20 - Main effect on likelihood of getting at least one bonus

Experimental condition	Main effect on likelihood of getting at least one bonus					
	(1)	(2)	(3)	(4)	(5)	(6)
Between-subject conditions						
Market competition	-0.03	-0.02	-0.03	-0.03	-0.03	-0.03
	(0.04)	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)
Peer competition	0.02	0.01	0.02	0.01	0.01	-0.00
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Within-subject condition						
Private payment	0.03	0.03	0.03	0.03	0.03	0.03
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)

Note: for the between-subject conditions the comparison is with respect to the control experimental condition. On the other hand, for the within-subject experimental condition the comparison is with respect to the health system payment condition.

Source: Authors' elaboration

Quality of service

To ensure a comprehensive approach to the quality of service, we have used different measures, namely: the likelihood of getting a correct diagnosis, the likelihood of getting a correct prescription, and the likelihood of prescribing generic drugs.

Impact of the experimental conditions on the likelihood of getting a correct diagnosis

The outcome variable is the likelihood of getting a correct diagnosis in the experiment. This is a dummy variable that has the value of 1 if the doctor correctly makes the diagnosis of the medical case, otherwise, the value is 0. To capture the impact of the experimental conditions on the likelihood of getting a correct diagnosis by the doctors in the experiment, we report two tables. Table 21 shows the results of the estimation of the model with interaction and Table 22 shows the results of the model with the main effects of the experimental conditions.

Notice that the results include different sets of covariates as controls such as demographics variables, preferences, prescription behaviour, and entrepreneurship preferences. The results also include a dummy variable to control for order effects for within-subject conditions. The last column in the table shows the result of the estimation with all the control variables.

Table 21 - Treatment effect on likelihood of getting a correct diagnosis

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	0.01	0.02	0.01	0.01	0.01	0.01
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	-0.02	-0.00	-0.02	-0.02	-0.02	-0.02
	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	-0.05	-0.04	-0.04	-0.07	-0.05	-0.04
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-0.09	-0.08	-0.09	-0.11*	-0.09	-0.09
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system})$	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system})$	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system})$	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}))$	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}))$	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Constant	0.52***	0.92***	0.48***	0.61***	0.54***	0.79**
	(0.04)	(0.20)	(0.13)	(0.06)	(0.05)	(0.32)
COVARIATES						
Demographics	NO	YES	NO	NO	NO	YES
Preferences	NO	NO	YES	NO	NO	YES
Prescription Behaviour	NO	NO	NO	YES	NO	YES
Entrepreneurship Preferences	NO	NO	NO	NO	YES	YES
Order effect	NO	YES	YES	YES	YES	YES
Observations	900	900	900	900	900	900
Number of id	150	150	150	150	150	150
Individual random effects	YES	YES	YES	YES	YES	YES

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

The complete regression could be found in the annex.

Source: Authors' elaboration.

The average value of the likelihood of getting a correct diagnosis in the control and health system payment conditions is 52%. Table 21 shows that **there is no statistical treatment effects on the likelihood of getting a correct diagnosis**. However, it is possible to see that, under private payment scheme, there is a tendency of decreasing the likelihood of getting a correct diagnosis under market and peer competition condition. To evaluate whether this result is statistically significant we look at the main effect.

Private payment has a (weakly significant) negative main effect on the likelihood of getting a correct diagnosis. **Being under the private payment condition reduces this probability, on average, by 6% with respect to the health system payment scheme[40].** Notice that the interpretation of this result, unlike the one presented in the treatment effects model above, is that the comparison with the health system payment scheme includes the three between-subject experimental conditions (i.e. control, market competition, peer competition), not only the control condition.

Table 22 - Main effect on likelihood of getting a correct diagnosis

Experimental condition	Main effect on likelihood of getting a correct diagnosis					
	(1)	(2)	(3)	(4)	(5)	(6)
Between-subject conditions						
Market competition	-0.00	0.01	-0.01	-0.01	-0.00	-0.00
	(0.05)	(0.05)	(0.05)	(0.04)	(0.05)	(0.04)
Peer competition	-0.07	-0.06	-0.06	-0.09**	-0.07	-0.07
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)
Within-subject condition						
Private payment	-0.06*	-0.06*	-0.06*	-0.06*	-0.06*	-0.06*
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)

Note: for the between-subject conditions the comparison is with respect to the control experimental condition. On the other hand, for the within-subject experimental condition the comparison is with respect to the health system payment condition.

Source: Authors' elaboration.

Impact of the experimental conditions on the likelihood of getting a correct prescription

The outcome variable is the likelihood of getting a correct prescription in the experiment. This is a dummy variable that has the value of 1 if the doctor correctly makes the prescription of the medical case, otherwise, the value is 0. To capture the impact of the experimental conditions on the likelihood of getting a correct prescription by doctors in the experiment, we report two tables. Table 23 shows the results of the estimation of the model with interactions and Table 24 shows the results of the model with the main effects of the experimental conditions.

Notice that the results include different sets of covariates as controls such as demographics variables, preferences, prescription behaviour, and entrepreneurship preferences. The results also include a dummy variable to control for order effects for within-subject conditions. The last column in the table shows the result of the estimation with all the control variables.

[40] Caveat: Although cases are expected to be well-balanced between within-subject conditions (i.e., private and health system schemes), the within-subject effect could potentially be influenced by differences in the level of difficulty in the medical cases. With the actual design it is not possible to identify if the effect is driven by treatment effect or by the level of difficulty.

Table 23 - Treatment effect on likelihood of getting a correct prescription

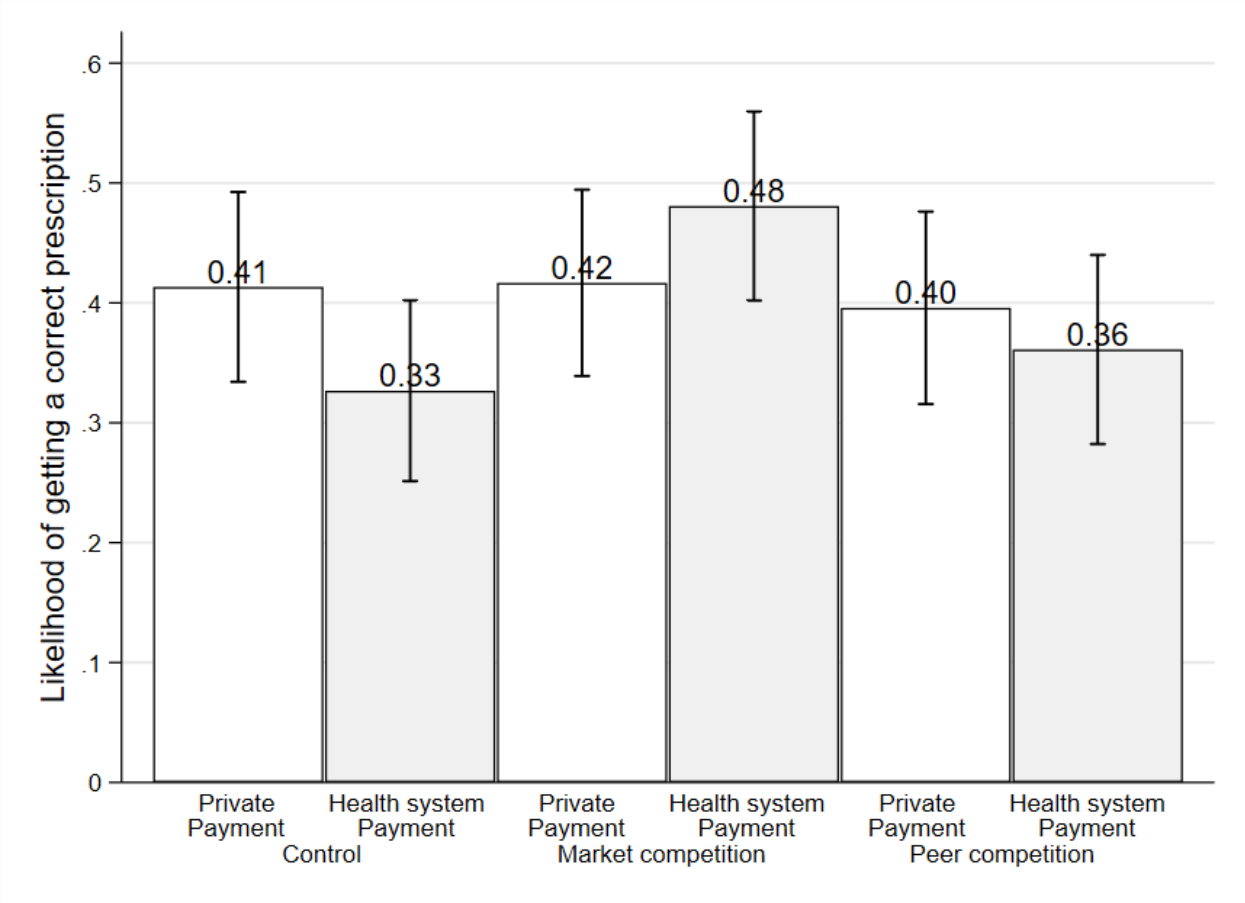
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ syste}$	0.15**	0.17***	0.16***	0.15**	0.15**	0.17***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	0.00	0.02	0.00	0.00	0.00	0.02
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ syste}$	0.03	0.06	0.04	0.02	0.03	0.05
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ syste}$	0.09	0.09	0.09	0.09	0.09	0.09
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ syste}$	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ syste}$	0.03	0.03	0.03	0.03	0.03	0.03
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ syst} - E(Y_{control}^{health\ syste}$	-0.15*	-0.15*	-0.15*	-0.15*	-0.15*	-0.15*
	(0.08)	(0.09)	(0.08)	(0.08)	(0.08)	(0.09)
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ syst} - E(Y_{control}^{health\ syste}$	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**
Constant	0.33***	0.42**	0.39***	0.44***	0.33***	0.44
	(0.04)	(0.19)	(0.12)	(0.08)	(0.05)	(0.27)
COVARIATES						
Demographics	NO	YES	NO	NO	NO	YES
Preferences	NO	NO	YES	NO	NO	YES
Prescription behaviour	NO	NO	NO	YES	NO	YES
Entrepreneurship preferences	NO	NO	NO	NO	YES	YES
Order effect	NO	YES	YES	YES	YES	YES
Observations	900	900	900	900	900	900
Number of id	150	150	150	150	150	150
Individual random effects	YES	YES	YES	YES	YES	YES
Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. The complete regression could be found in the annex.						

Source: Authors' elaboration.

The average value of the likelihood of getting a correct prescription in the control and health system payment conditions is 33%. The following results are shown in Table 23 and Figure 10. **Market competition under health system payment increases the probability of getting a correct prescription by 17% with respect to the control condition.** Finally, the difference-in-difference estimator for market competition and private payment scheme is -15 %. This means that, under private payment scheme, facing market competition reduces the probability of getting a correct prescription by 15 percent with respect to the situation of facing market competition under health system scheme.

Figure 10 - Treatment effect on likelihood of getting a correct prescription



Source: Authors' elaboration.

The main effect of market competition is 10%. **This means that, on average, market competition increases the likelihood of getting a correct prescription by 10% with respect to control.** In the same way, market competition increases the likelihood of getting a correct prescription by 8% with respect to peer competition. These results are also shown in Figure 11.

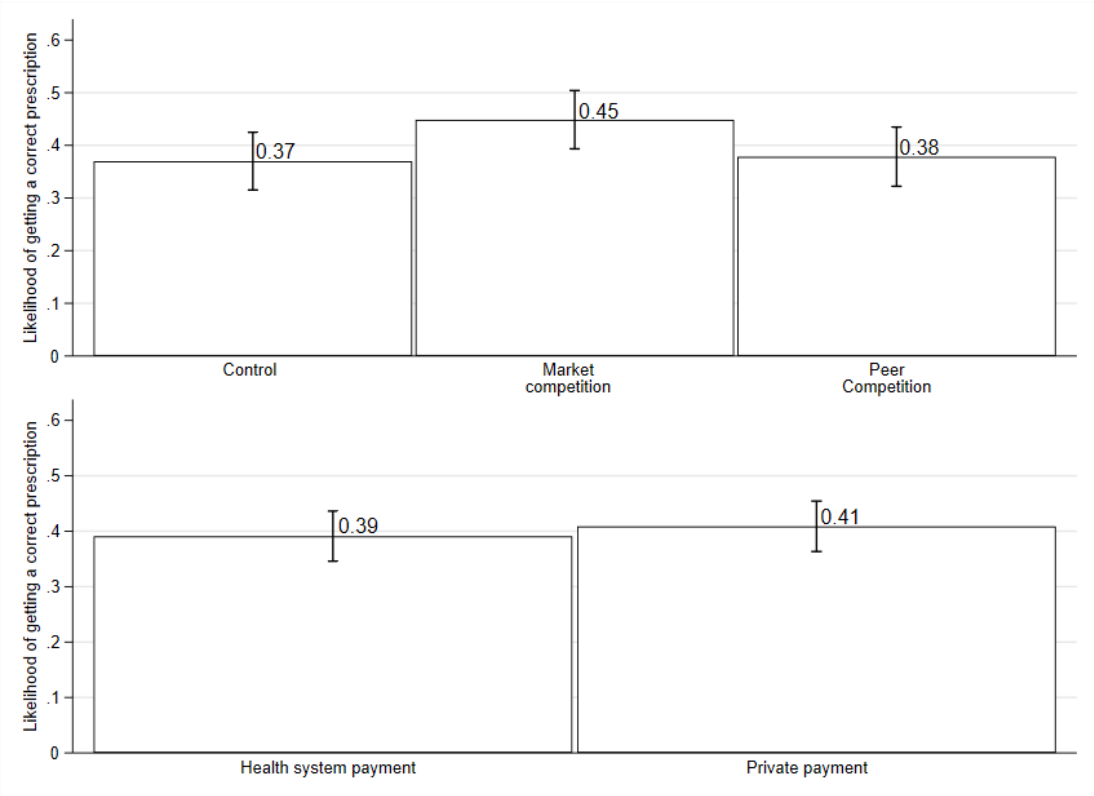
Table 24 - Main effect on likelihood of getting a correct prescription

Experimental condition	Main effect on likelihood of getting a correct prescription					
	(1)	(2)	(3)	(4)	(5)	(6)
Between-subject conditions						
Market competition	0.08*	0.10**	0.08*	0.08*	0.08*	0.10**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Peer competition	0.01	0.03	0.01	-0.01	0.01	0.02
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Within-subject condition						

Experimental condition	Main effect on likelihood of getting a correct prescription					
	(1)	(2)	(3)	(4)	(5)	(6)
Private payment	0.02	0.02	0.02	0.02	0.02	0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Note: for the between-subject conditions the comparison is with respect to the control experimental condition. On the other hand, for the within-subject experimental condition the comparison is with respect to the health system payment condition.						

Source: Authors' elaboration.

Figure 11 - Main effect on likelihood of getting a correct prescription



Source: Authors' elaboration.

Impact of the experimental conditions on the likelihood of prescribing generic drugs

The outcome variable is the likelihood of prescribing generic drugs in the experiment. This is a dummy variable that has the value of 1 if the doctor prescribes a generic drug in the medical prescription, otherwise, the value is 0. To capture the impact of the experimental conditions on the likelihood of prescribing generic drugs by doctors in the experiment, we report two tables. Table 25 shows the results of the estimation of the model with interactions and Table 26 shows the model with the main effects of the experimental conditions.

Notice that the results include different sets of covariates as controls such as demographics variables, preferences, prescription behaviour, and entrepreneurship preferences. The results also include a dummy variable to control for order effects for within-subject conditions. The last column in the table shows the result of the estimation with all the control variables.

Table 25 - Treatment effect on likelihood of prescribing generic drugs

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}$	0.08*	0.09**	0.08*	0.08*	0.08*	0.09**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	0.00	0.00	0.02	0.00	0.00	0.02
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}$	0.03	0.05	0.03	0.03	0.03	0.04
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-0.02	-0.00	-0.02	-0.02	-0.02	-0.01
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system}$	0.05	0.05	0.05	0.05	0.05	0.05
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system}$	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system}$	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)

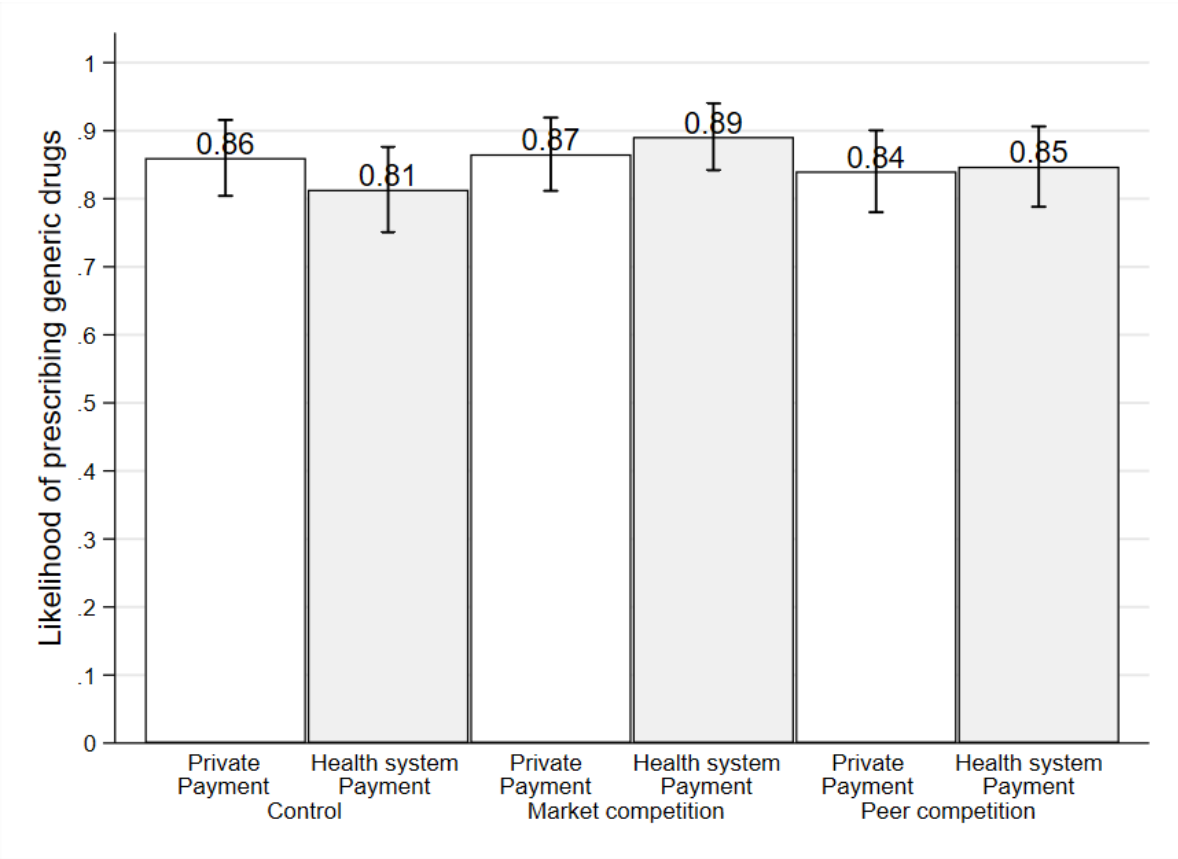
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Constant	0.81***	*0.86****	0.93***	0.76***	0.80***	0.97***
	(0.03)	(0.15)	(0.09)	(0.06)	(0.03)	(0.20)
COVARIATES						
Demographics	NO	YES	NO	NO	NO	YES
Preferences	NO	NO	YES	NO	NO	YES
Prescription behaviour	NO	NO	NO	YES	NO	YES
Entrepreneurship preferences	NO	NO	NO	NO	YES	YES
Order effect	NO	YES	YES	YES	YES	YES
Observations	900	900	900	900	900	900
Number of id	150	150	150	150	150	150
Individual random effects	YES	YES	YES	YES	YES	YES

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' elaboration.

The average value of the likelihood of prescribing generic drugs in the control and health system payment conditions is 81%. Table 25 and Figure 12 show that **market competition increases the likelihood of prescribing generic drugs, on average, by 9% with respect to control condition under health system payment scheme.**

Figure 12 - Treatment effect on likelihood of prescribing generic drugs



Source: Authors' elaboration.

The main effect of market competition is 5%. In other words, **market competition increases the likelihood of prescribing a generic drug by 5% with respect to the control condition.** A similar result is observed when we compare the impact of market competition with respect to peer competition. These results are also shown in Figure 13.

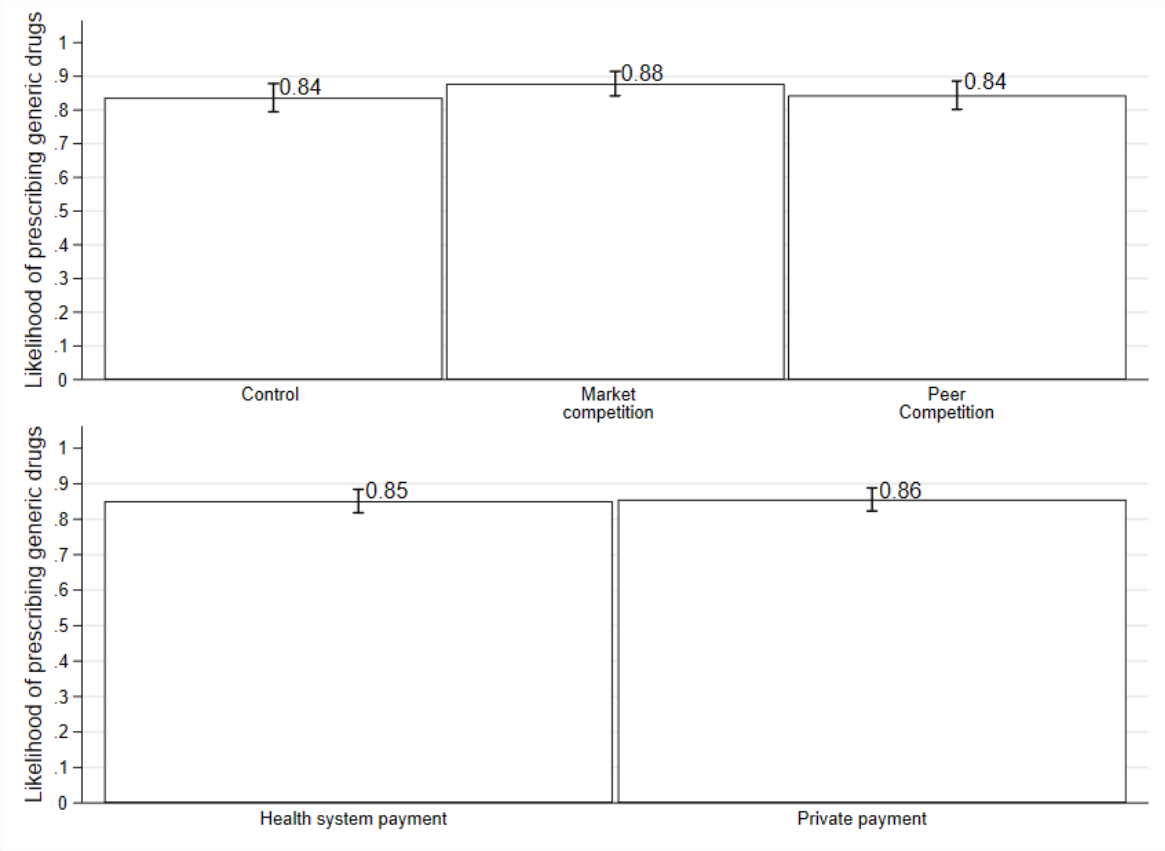
Table 26 - Main effect on likelihood of prescribing a generic drug

Experimental condition	Main effect on likelihood of prescribing a generic drug					
	(1)	(2)	(3)	(4)	(5)	(6)
Between-subject conditions						
Market competition	0.04	0.05*	0.04	0.04	0.05	0.05**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Peer competition	0.01	0.03	0.01	0.00	0.00	0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)

Experimental condition	Main effect on likelihood of prescribing a generic drug					
	(1)	(2)	(3)	(4)	(5)	(6)
Within-subject condition						
Private payment	0.00	0.00	0.00	0.00	0.00	0.00
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Note: for the between-subject conditions the comparison is with respect to the control experimental condition. On the other hand, for the within-subject experimental condition the comparison is with respect to the health system payment condition.						

Source: Authors' elaboration.

Figure 13 - Main effect on likelihood of prescribing generic drugs



Source: Authors' elaboration.

4.1.2 Patients behaviour in Spain

In this section we report the results of the estimation of our econometric model for patients. We report two outcome variables. The first is whether the patient follows or not the medical prescription made by the doctor. This outcome variable is observed in all the experimental conditions. The second outcome variable is whether the patient in the market competition condition pays for a second diagnosis made by another doctor. For the second variable we compare the results between private payment scheme and health system payment scheme.

Table 27 shows the results of the estimation of the model with interactions and

Table 28 - Main effect on likelihood of following doctor's prescription

Experimental condition	Main effect on likelihood of following the doctor's prescription			
	(1)	(2)	(3)	(4)
Between-subject conditions				
Market competition	0.15***	0.15***	0.16***	0.16***
	(0.03)	(0.03)	(0.03)	(0.03)
Peer competition	-0.05	-0.04	-0.04	-0.03
	(0.04)	(0.04)	(0.04)	(0.04)
Within-subject condition				
Private payment	-0.13***	-0.13***	-0.13***	-0.13***
	(0.02)	(0.02)	(0.02)	(0.02)
Note: for the between-subject conditions the comparison is with respect to the control experimental condition. On the other hand, for the within-subject experimental condition the comparison is with respect to the health system payment condition.				

Source: Authors' elaboration.

shows the model with the main effects of the experimental conditions. Notice that the results include different sets of covariates as controls such as demographics variables and preferences. The results also include a dummy variable to control for order effects for within-subject conditions. The last column in the table shows the result of the estimation with all the control variables.

Table 27 - Treatment effect on likelihood of following doctor's prescription

	(1)	(2)	(3)	(4)
VARIABLES	**P(following doctor prescription)**	**P(following doctor prescription)**	**P(following doctor prescription)**	**P(following doctor prescription)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	0.12***	0.12***	0.13***	0.12***
	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	0.19***	0.18***	0.19***	0.19***
	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	-0.04	-0.03	-0.03	-0.02
	(0.04)	(0.04)	(0.05)	(0.05)

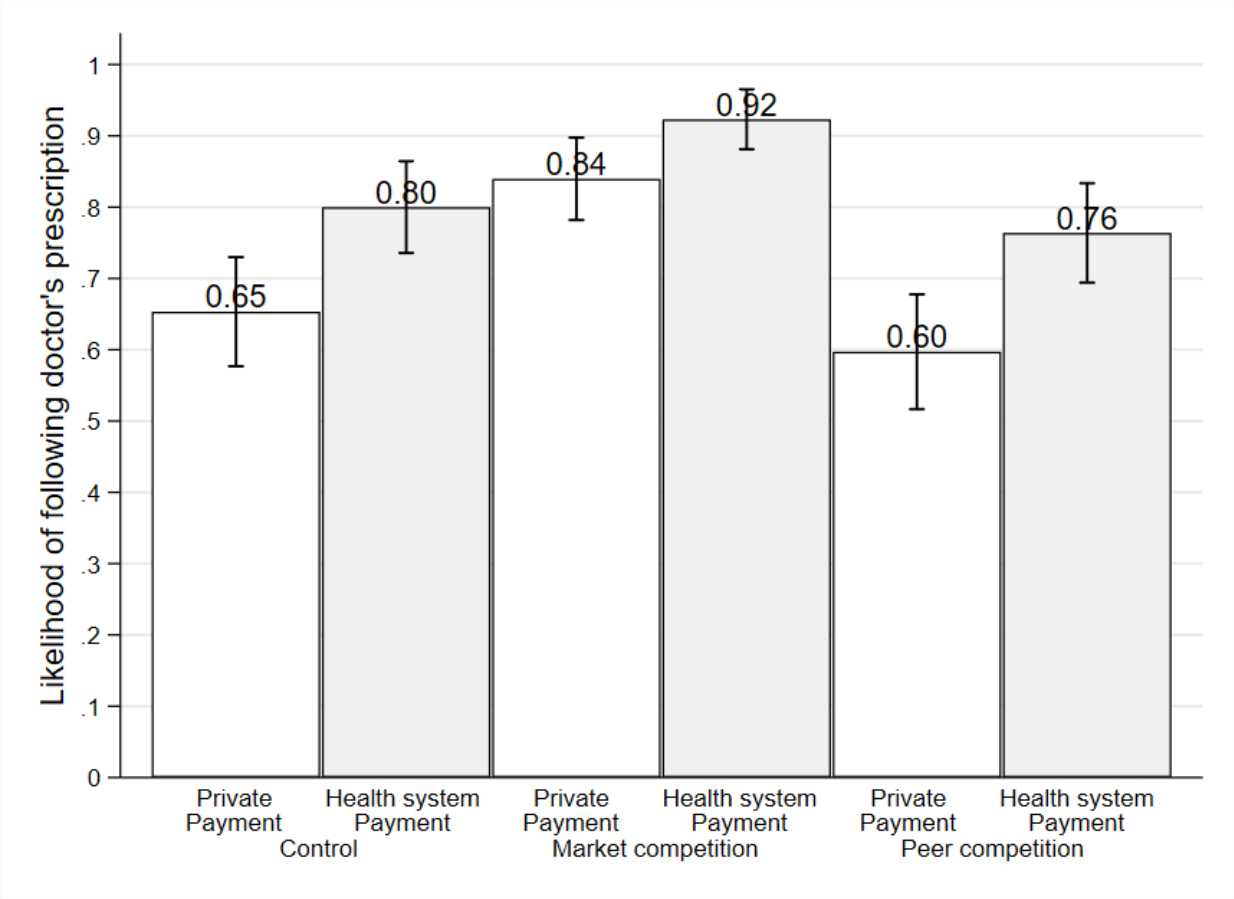
	(1)	(2)	(3)	(4)
VARIABLES	**P(following doctor prescription)**	**P(following doctor prescription)**	**P(following doctor prescription)**	**P(following doctor prescription)**
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-0.04	-0.04	-0.04	-0.04
	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system})$	-0.15***	-0.15***	-0.15***	-0.15***
	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system})$	-0.08**	-0.08**	-0.08**	-0.08**
	(0.03)	(0.03)	(0.03)	(0.03)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system})$	-0.17***	-0.17***	-0.17***	-0.17***
	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}))$	0.06	0.06	0.06	0.06
	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}))$	-0.02	-0.02	-0.02	-0.02
	(0.06)	(0.06)	(0.06)	(0.06)
Constant	0.80***	0.74***	0.81***	0.77***
	(0.03)	(0.07)	(0.09)	(0.13)
Demographics	NO	YES	NO	YES
Preferences	NO	NO	YES	YES
Order effect	NO	YES	YES	YES
Observations	900	900	900	900
Number of id	150	150	150	150

	(1)	(2)	(3)	(4)
VARIABLES	**P(following doctor prescription)**	**P(following doctor prescription)**	**P(following doctor prescription)**	**P(following doctor prescription)**
Individual random effects	YES	YES	YES	YES

Source: Authors' elaboration.

The average value of the likelihood of following a doctor prescription in the control and health system payment conditions is 80%. The following results are presented in Table 27 and Figure 14. **Market competition increases the probability of following doctor's prescription by 12% with respect to control condition under health system payment scheme.** In the same way, **market competition increases the probability of following doctor's prescription by 19% with respect to control condition under private payment scheme.** On the other hand, **there is a generalised negative effect of being under private payment scheme across conditions, namely: control condition, -15%; market competition, -8%; peer competition, -17%.**

Figure 14 - Treatment effect on likelihood of following doctor's prescription



Source: Authors' elaboration.

The main effect of market competition is 16%. In other words, market competition increases the likelihood of following the doctor's prescription by 15% with respect to the control condition and by 20% with respect to peer competition condition. These results are also shown in Figure 15. This result could be interpreted as an increase in confidence in doctors in the presence of market competition. In general, there is a mismatch between the diagnosis and the

prescriptions of the first doctor and that of the second doctor. In fact, there is only a 12.8% match for diagnosis and 8% for prescriptions, so it seems the effect is not driven by the fact the diagnosis and prescriptions are the same. Additionally, patients did not show a different probability of following the first doctor's prescription in the group of those who paid to obtain a second medical opinion compared to the group who did not obtain a second medical opinion (t = -0.3772; p value = 0.7063).The **main effect of private payment scheme** on the likelihood of following the prescription is -13%[41]**.** This outcome reinforces the results shown in Table 27, but unlike the ones presented in the treatment effects model above, this comparison is with the health system payment scheme including the three between-subject experimental conditions (i.e. control, market competition, peer competition), not making separate comparisons. This result seems to be a rational response for patients because they had to pay the complete cost of the medical treatment in private payment scheme.

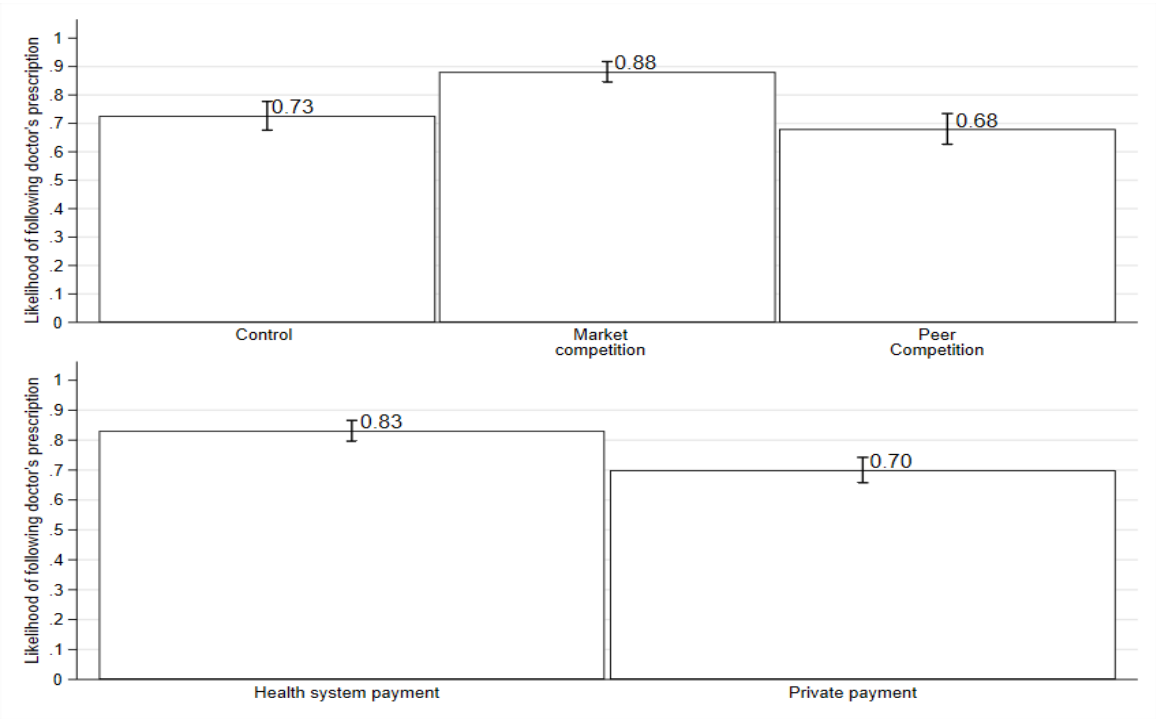
Table 28 - Main effect on likelihood of following doctor's prescription

Experimental condition	Main effect on likelihood of following the doctor's prescription			
	(1)	(2)	(3)	(4)
Between-subject conditions				
Market competition	0.15***	0.15***	0.16***	0.16***
	(0.03)	(0.03)	(0.03)	(0.03)
Peer competition	-0.05	-0.04	-0.04	-0.03
	(0.04)	(0.04)	(0.04)	(0.04)
Within-subject condition				
Private payment	-0.13***	-0.13***	-0.13***	-0.13***
	(0.02)	(0.02)	(0.02)	(0.02)
Note: for the between-subject conditions the comparison is with respect to the control experimental condition. On the other hand, for the within-subject experimental condition the comparison is with respect to the health system payment condition.				

Source: Authors' elaboration.

[41] Caveat: Although cases are expected to be well-balanced between within-subject conditions (i.e., private and health system schemes), the within-subject effect could potentially be influenced by differences in the level of difficulty in the medical cases. With the actual design it is not possible to identify if the effect is driven by treatment effect or by the level of difficulty.

Figure 15 - Main effect of likelihood of following doctor's prescription

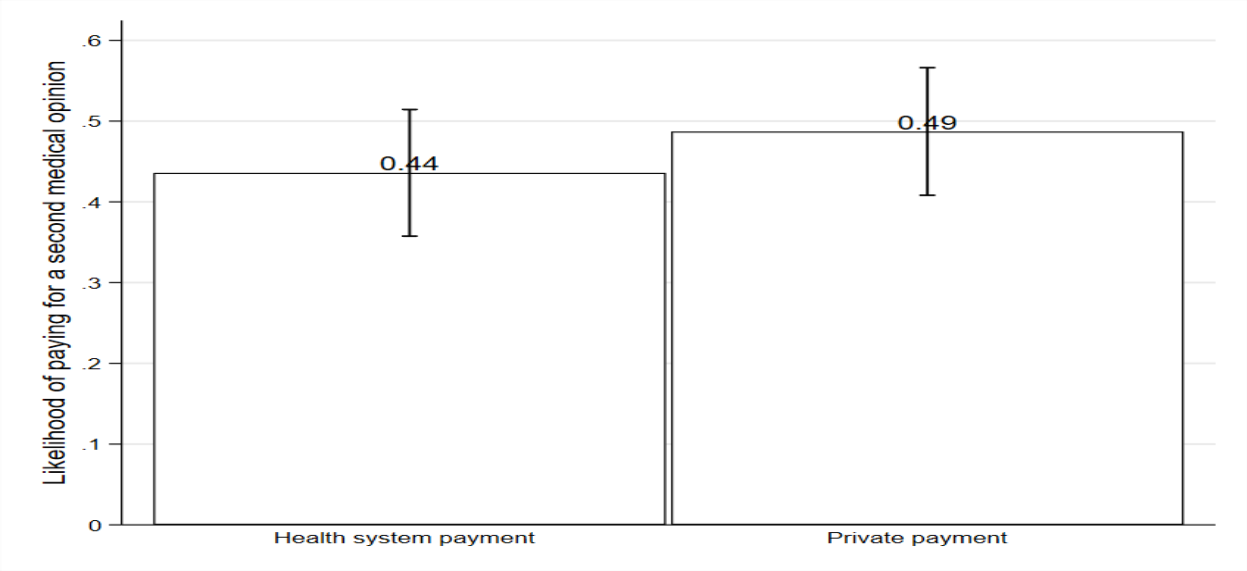


Source: Authors' elaboration.

Analysis for market competition treatment

There is no significant treatment effect of being under private payment scheme on the likelihood of paying for a second diagnosis with respect to being under health system payment scheme in the market competition condition. This result is presented in Figure 16.

Figure 16 - Comparison of the likelihood of paying for a second medical opinion between payment schemes



Source: Authors' elaboration.

4.2 Results in The Netherlands

Sample characteristics

In the Netherlands, a total of 152 doctors and 152 subjects in the role of patients participated in the experiment. Table 29 shows the distribution across experimental conditions of the sample. It is important to recall that participants are the same in the two within-subject conditions (i.e. health system payment and private payment). The average payoff for doctors was 56.5 Euros (s.d. 2.4 Euros), while the payments for the patients were 17.5 Euros (SD= 7.5 Euros) which includes a fixed participation fee of 4 Euros

Table 29 - Sample distributions across experimental conditions, the Netherlands

	Control	Market competition	Peer competition
Health system payment	53	51	48
Private payment	53	51	48

Source: Authors' elaboration.

Table 30 shows the descriptive statistics of the sociodemographic variables across experimental conditions for doctors. Overall, 67% of the sample are females and the average age is 31 years old. 25% of the sample is married and 17% is in a relationship with another

doctor. On average, doctors got a medical degree 6 years ago. Almost the entire sample has a specialty (86%) and 11% have 10 or more years of experience working in the field of specialisation. Indeed, 9% of the sample has 10 or more years in the current job. Only 19% of the doctors have parents, grandparents, or siblings' that are also doctors. In the income relative position scale with respect to other doctors, the average position self-reported is 3.8 where 1 is the "worst paid" and 10 is the "best paid". Finally, in the income relative position scale with respect to the entire population, the average position self-reported is 6.0 where 1 is the "worst paid" and 10 is the "best paid".

Table 30 - Descriptive statistics, sociodemographic variables for doctors (mean and standard deviation)

Variable	Experimental conditions			
	Control	Market Competition	Peer Competition	Total
% Females	0.70	0.57	0.75	0.67
	(0.50)	(0.50)	(0.52)	(0.51)
Age	29	33	30	31
	(7.4)	(11.3)	(7.2)	(9.1)
% Married	0.23	0.31	0.21	0.25
	(0.41)	(0.46)	(0.40)	(0.43)
% with partner doctor	0.16	0.19	0.14	0.17
	(0.37)	(0.39)	(0.35)	(0.37)
Years since the degree	5.5	7.1	4.6	6.0
	(17.4)	(10.7)	(6.8)	(12.7)
% who have a medical specialty	0.98	0.88	0.71	0.86
	(0.14)	(0.32)	(0.45)	(0.34)
% with 10 or more years working in the specialty field	0.08	0.18	0.06	0.11
	(0.26)	(0.38)	(0.24)	(0.30)
% with 10 or more years in the current job	0.06	0.17	0.04	0.09
	(0.23)	(0.38)	(0.20)	(0.29)
% with parents, grandparents, or siblings' doctors	0.18	0.25	0.13	0.19

Variable	Experimental conditions			
	Control	Market Competition	Peer Competition	Total
	(0.39)	(0.43)	(0.33)	(0.39)
Income position with respect to other doctors [min=1: worst paid; max=10: best paid]	3.7	3.8	4.1	3.8
	(2.30)	(2.35)	(1.99)	(2.23)
Income position with respect to the entire population [min=1: worst paid; max=10: best paid]	5.4	6.2	6.5	6.0
	(2.73)	(2.48)	(1.74)	(2.41)

Note: Standard deviation in parenthesis.
Source: Authors' elaboration.

Table 31 shows the descriptive statistics of the prescription behaviour across experimental conditions for doctors. Overall, 70% answered "YES" to the question "Do you prescribe generic drugs?". 30% answered "YES" to the question "Have you ever read any article comparing the safety and efficacy of generic vs. brand-name drugs?", while 55% of the doctors answered "YES" to the question "Do you feel comfortable if pharmacists change a brand-name drug prescribed by you?". Finally, 22% of the doctors answered "YES" to the question "Do you prescribe brand-name drugs because their names are easier to memorize?".

Table 31 - Descriptive statistics, prescription behaviour (mean and standard deviation of % of doctors that answered YES)

Variable	Experimental conditions			
	Control	Market Competition	Peer Competition	Total
Do you prescribe generic drugs?	0.58	0.70	0.81	0.70
	(0.49)	(0.45)	(0.39)	(0.45)
Have you ever read any article comparing the safety and efficacy of generic vs. brand-name drugs?	0.23	0.37	0.31	0.30
	(0.41)	(0.48)	(0.46)	(0.45)
Do you feel comfortable if pharmacists change a brand-name drug prescribed by you?	0.43	0.55	0.67	0.55
	(0.50)	(0.50)	(0.47)	(0.49)
Do you prescribe brand-name drugs because their names are easier to memorize?	0.2	0.3	0.15	0.22
	(0.40)	(0.45)	(0.35)	(0.41)

Note: Standard deviation in parenthesis.
Source: Authors' elaboration.

Table 32 shows the answers to the questions regarding beliefs and feelings about generic drugs in the doctors of the entire sample. As is shown in the Table 32, in most of the statements there seem to be a consensus between the doctors that participate in the experiment. In fact, in almost all the statements either more than 50% of the doctors disagree with the statement (e.g. completely disagree or partially disagree) or more than 50% of the doctors agree with the statement (e.g. partially agree or completely agree).

In particular, 92.1% of the doctors disagree with the statement "Generic drugs are cheaper because they are less efficacious". In contrast, 86.4% of the doctors agree with the statement "Generic drugs are used to treat the same diseases". 72.4% of the doctors agree with the statement "Generic drugs have a different package than brand-name drugs". However, 90.1% disagree with the statement "Generic drugs are purely herbal products and do not contain any chemical agents". 85.5% of the doctors disagree with the statement "Unlike brand-name drugs, generic drugs are produced naturally". 87.5% of doctors disagree with the statement "Generic drugs are good for less severe diseases". In the same way, 82.2% of doctors disagree with the statement "Generic drugs are made with lower quality substances". 86.8% of doctors agree with the statement "Generic drugs are as effective as brand-name drugs". 89.4% of doctors agree with the statement "Generic drugs have the same effect as brand-name drugs". 86.2% of doctors disagree with the statement "Treatments with generic drugs take longer". 87.5% of doctors disagree with the statement "Generic drugs take longer to be efficacious". 85.5% of doctors disagree with the statement "Frequently, it is necessary to take twice the amount of the active ingredient of the generic drug to have the same effect as the brand-name drug". 77.6% of doctors disagree with the statement "Compared with brand-name drugs, generic drugs have been in the market for a shorter time period, so they have more risks and side effects". 90.1% of doctors disagree with the statement "Generic antibiotics are less efficacious than brand-name antibiotics". 71.7% of doctors disagree with the statement "Doctors who can dispense medications directly to their patients do not dispense generic drugs". On the other hand, 67.8% of doctors agree with the statement "The active ingredients of generic drugs have the same side effects than the active ingredients of brand-name drugs". 34.2% of doctors agree with the statement "Generic drug manufacturers spend less money in research for the development of their drugs". 59.21% of doctors disagree with the statement "Generic drugs have better quality control than brand-name drugs". 77% of doctors agree with the statement "Generic contraceptives are as safe as brand-name contraceptives". 68.4% of doctors agree with the statement "Generic drugs may contain different inactive ingredients than brand-name drugs". Finally, 50% of doctors disagree with the statement "Generic drug manufacturers and brand-name drug manufacturers spend the same amount of money for patent protection".

Table 32 - Beliefs and feelings about generic drugs

Statement	Completely disagree	Partially disagree	I am not sure	Partially agree	Completely agree	Total
Generic drugs are cheaper because they are less efficacious	57.9%	34.2%	6.6%	1.3%	0%	100%
Generic drugs are used to treat the same diseases	1.3%	2.6%	9.2%	52.0%	34.9%	100%

Statement	Completely disagree	Partially disagree	I am not sure	Partially agree	Completely agree	Total
Generic drugs have a different package than brand-name drugs	1.3%	4.6%	21.7%	54.6%	17.8%	100%
Generic drugs are purely herbal products and do not contain any chemical agents	69.1%	21.1%	8.6%	1.3%	0%	100%
Unlike brand-name drugs, generic drugs are produced naturally	61.8%	23.7%	13.8%	0.7%	0%	100%
Generic drugs are good for less severe diseases	55.9%	31.6%	7.2%	4.6%	0.7%	100%
Generic drugs are made with lower quality substances	46.1%	36.2%	17.8%	0%	0%	100%
Generic drugs are as effective as brand-name drugs	1.3%	2.6%	9.2%	50.0%	36.8%	100%
Generic drugs have the same effect as brand-name drugs	0%	2.6%	7.9%	54.6%	34.9%	100%
Treatments with generic drugs take longer	44.1%	42.1%	13.82%	0%	0%	100%
Generic drugs take longer to be efficacious	40.1%	47.4%	11.8%	0.7%	0%	100%
Frequently, it is necessary to take twice the amount of the active ingredient of the generic	48.7%	36.8%	13.8%	0.7%	0%	100%

Statement	Completely disagree	Partially disagree	I am not sure	Partially agree	Completely agree	Total
drug to have the same effect as the brand-name drug						
Compared with brand-name drugs, generic drugs have been in the market for a shorter time period, so they have more risks and side effects	36.8%	40.8%	17.8%	4.6%	0%	100%
Generic antibiotics are less efficacious than brand-name antibiotics	48.0%	42.1%	9.2%	0.7%	0%	100%
Doctors who can dispense medications directly to their patients do not dispense generic drugs	39.4%	32.2%	25.7%	2.6%	0%	100%
The active ingredients of generic drugs have the same side effects than the active ingredients of brand-name drugs	4.0%	9.9%	18.4%	40.8%	27.0%	100%
Generic drug manufacturers spend less money in research for the development of their drugs	13.0%	21.7%	41.5%	19.7%	4.6%	100%
Generic drugs have better quality control	24.3%	34.9%	36.8%	3.3%	0.7%	100%

Statement	Completely disagree	Partially disagree	I am not sure	Partially agree	Completely agree	Total
than brand-name drugs						
Generic contraceptives are as safe as brand-name contraceptives	0.7%	6.6%	15.8%	46.1%	30.9%	100%
Generic drugs may contain different inactive ingredients than brand-name drugs	0.7%	4.0%	27.0%	45.4%	23.0%	100%
Generic drug manufacturers and brand-name drug manufacturers spend the same amount of money for patent protection	21.7%	28.3%	46.7%	3.3%	0%	100%

Source: Authors' elaboration.

Table 33 shows the descriptive statistics of the individual preferences across experimental conditions for doctors. In particular, this table presents the results for risk aversion, financial risk aversion, time preference, inequality aversion, political participation, reciprocity, and altruism. For risk aversion, the average number selected on a scale from 1 [Completely unwilling to take risks] to 5 [Completely willing to take risks] was 3.0, while for financial risk aversion the number was 2.6. This clearly shows that doctors in the sample are more risk averse in financial activities with respect to other activities. For time preferences, the average number selected on a scale from 1 [Completely unwilling to give up something today] to 5 [Completely willing to give up something today] was 3.9. For inequality aversion, the average number selected on a scale from 1 [Completely unwilling to incur costs to punish unfair behaviours] to 5 [Very willing to incur costs to punish unfair behaviours] was 3.7. Regarding political participation, 70% of the doctors vote every time when there are elections. Doctors were willing to reciprocate at a cost of almost one fifth of the maximum. Finally, as a measure of altruism, on average, doctors were willing to donate 7.2% of the prize of a 10,000 Euros lottery to charity.

Table 33 - Descriptive statistics, preferences (average and standard deviation)

Variable	Experimental conditions			
	Control	Market Competition	Peer Competition	Total
Risk aversion [min=1: Completely unwilling to take risks; max=5: Completely willing to take risks]	3.0	2.9	3.0	3.0
	(0.75)	(0.87)	(0.91)	(0.84)
Financial risk aversion [min=1: Completely unwilling to take financial risks; max=5: Completely willing to take financial risks]	2.7	2.6	2.4	2.6
	(0.94)	(0.93)	(0.91)	(0.94)
Time preference [min=1: Completely unwilling to give up something today; max=5: Completely willing to give up something today]	3.8	3.9	3.9	3.9
	(0.56)	(0.70)	(0.70)	(0.66)
Inequality aversion [min=1: Completely unwilling to incur costs to punish unfair behaviours; max=5: Very willing to incur costs to punish unfair behaviours]	3.8	3.5	3.8	3.7
	(0.70)	(0.84)	(0.78)	(0.78)
% of participation in political elections (vote every time)	0.64	0.69	0.77	0.70
	(0.48)	(0.46)	(0.42)	(0.45)
Reciprocity [min= 5-euro bottle; max= 30-euro bottle]	17.8	19.6	16.3	17.9
	(7.37)	(7.99)	(7.48)	(7.73)
Altruism [Share of a EUR 10,000 lottery willing to donate to charity]	6.2	7.8	7.5	7.2
	(10.51)	(11.95)	(11.70)	(11.39)

Note: Standard deviation in parenthesis.
Source: Authors' elaboration.

Table 34 shows the descriptive statistics of the entrepreneurship preferences across experimental conditions for doctors. First, 24% of the doctors answered "YES" to the question "Have you ever been self-employed (self-employed or entrepreneur)?". Secondly, 28% of the doctors answered "YES" to the question "Have you ever seriously considered becoming an entrepreneur?". In the statement "I am willing to do whatever it takes to be an entrepreneur", the average number selected on a scale from 1 [Total disagreement] to 7 [Full agreement] was 3.1. However, in the statement "My professional goal is to become an entrepreneur", the average number selected on a scale from 1 [Total disagreement] to 7 [Full agreement] was 2.7. When we look at the statement "I will endeavour to create and run my own business",

the average number selected on a scale from 1 [Total disagreement] to 7 [Full agreement] was 3.2. For the statement "I am determined to create a company in the future", the average number selected on a scale from 1 [Total disagreement] to 7 [Full agreement] was 2.7. Finally, for statements "I have thought very seriously about creating a company" and "I have the firm intention of starting a company one day", the average number selected on a scale from 1 [Total disagreement] to 7 [Full agreement] was 2.6.

Table 34 - Descriptive statistics, entrepreneurship (average and standard deviation)

Variable	Experimental conditions			
	Control	Market Competition	Peer Competition	Total
Have you ever been self-employed (self-employed or entrepreneur)? [Share of % of doctors that answered YES]	0.13	0.4	0.2	0.24
	(0.34)	(0.48)	(0.40)	(0.42)
Have you ever seriously considered becoming an entrepreneur? [Share of % of doctors that answered YES]	0.17	0.39	0.27	0.28
	(0.38)	(0.48)	(0.45)	(0.45)
I am willing to do whatever it takes to be an entrepreneur [min=1: Total disagreement; max=7: Full agreement]	3.0	3.3	3.0	3.1
	(1.73)	(1.83)	(1.38)	(1.68)
My professional goal is to become an entrepreneur [min=1: Total disagreement; max=7: Full agreement]	2.6	2.9	2.5	2.7
	(1.64)	(1.74)	(1.46)	(1.62)
I will endeavour to create and run my own business [min=1: Total disagreement; max=7: Full agreement]	3.0	3.4	3.3	3.2
	(1.68)	(1.97)	(1.91)	(1.86)
I am determined to create a company in the future [min=1: Total disagreement; max=7: Full agreement]	2.5	3.0	2.6	2.7

Variable	Experimental conditions			
	Control	Market Competition	Peer Competition	Total
	(1.47)	(1.97)	(1.70)	(1.74)
I have thought very seriously about creating a company [min=1: Total disagreement; max=7: Full agreement]	2.5	2.9	2.5	2.6
	(1.49)	(2.02)	(1.83)	(1.80)
I have the firm intention of starting a company one day [min=1: Total disagreement; max=7: Full agreement]	2.4	3.0	2.4	2.6
	(1.43)	(2.08)	(1.70)	(1.78)

Note: Standard deviation in parenthesis.
Source: Authors' elaboration.

Finally, we tested the balance in the covariates between experimental conditions with an F-test[42]. The F-test showed differences in all the covariates across experimental conditions. These results suggest that in order to have a correct specification of the estimation of the causal effects in our model through comparable groups, it is necessary to introduce the observable variables as covariates in the estimation.

4.2.1 Causal impact of experimental conditions on outcome variables

In this section, we will show the results of the estimation of the models presented above. First, we present the results and analysis for the model stated in Equation [1] to identify the treatment effects and then we present the results and analysis for the model stated in Equation [2] to identify the main effects of the experimental conditions. The analysis is divided into two groups of outcome variables, namely: Productivity and Quality of service. The former includes an efficiency index, the probability of getting the high bonus, and the probability of getting at least one bonus, while the latter includes the probability of getting a correct diagnosis, the probability of getting a correct prescription and, the probability of prescribing a generic drug.

Table 35 show the descriptive statistics for the outcome variables, we include the mean and the standard deviation in parenthesis. The table presents the results by experimental conditions and the overall sample average.

[42] To do this we ran a multinomial logit estimation with the treatment variable as the dependent variable and the covariates as independent variables. Then, we performed an F-Test to verify if there is any significant difference in all the covariates between conditions. We ran a test for all the sets of covariates presented above. For demographics (chi2=179.10, p-value=0.0000), preferences (chi2=78.01, p-value=0.0000), prescription behaviour (chi2=84.38, p-value=0.0000), Entrepreneurship preferences (chi2=62.50, p-value=0.0000), and overall (chi2=65.47, p-value=0.0000).

Table 35 Descriptive statistics for outcomes variables, the Netherlands

Experimental condition		Outcome variables					
		Productivity			Quality of service		
		Time spent in solving the case (seconds)	Probability of getting the high bonus	Probability of getting at least one bonus	Probability of getting a correct diagnosis	Probability of getting a correct prescription	Probability of prescribing a generic drug
Control	Private	108.65	0.64	0.92	0.38	0.30	0.90
		(63.22)	(0.48)	(0.28)	(0.49)	(0.46)	(0.30)
	Health system	128.55	0.59	0.87	0.51	0.42	0.72
		(70.68)	(0.49)	(0.33)	(0.50)	(0.50)	(0.45)
Market competition	Private	118.44	0.61	0.90	0.36	0.24	0.96
		(72.86)	(0.49)	(0.30)	(0.48)	(0.43)	(0.19)
	Health system	122.02	0.57	0.89	0.45	0.48	0.73
		(70.36)	(0.49)	(0.32)	(0.50)	(0.50)	(0.44)
Peer competition	Private	105.63	0.71	0.90	0.31	0.23	0.88
		(65.27)	(0.46)	(0.30)	(0.47)	(0.42	(0.33)
	Health system	121	0.61	0.90	0.48	0.44	0.80
		(63.74)	(0.49)	(0.30)	(0.50)	(0.50)	(0.40)
Overall		117.48	0.62	0.90	0.42	0.35	0.83
		(68.12)	(0.49)	(0.30)	(0.50)	(0.48)	(0.37)

Source: Authors' elaboration.

Productivity

We have three measures of doctor's productivity in the experiment: time spent in solving the case, likelihood of getting the high bonus, and likelihood of getting at least one bonus.

Impact of the experimental conditions on time spent in solving the case

To capture the impact of the experimental conditions on the time spent in solving the case by the doctors in the experiment, we report two tables. Table 36 shows the results of the estimation of the model. The second table, Table 37, shows the main effect of the experimental conditions.

The outcome variable, time spent in solving the case, captures the time in seconds that each doctor spends in solving the medical case (including both diagnosis and prescription). Since this variable has several outliers that could affect seriously the estimation of the actual impact, we correct the estimation for outliers. To handle this, we identified the extreme values

between the observations in each treatment group, in particular, the five lowest values and the five highest values following the method used by Cox (2017). Notice that the results include different sets of covariates as controls such as demographics variables, preferences, prescription behaviour, and entrepreneurship preferences. The results also include a dummy variable to control for order effects for within-subject conditions. The last column in the table shows the result of the estimation with all the control variables.

Table 36 - Treatment effects on the time spent in solving the case

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	-6.53	-3.30	-7.90	-5.29	-3.37	-3.25
	(10.22)	(9.92)	(9.82)	(10.22)	(10.36)	(9.77)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	9.79	13.02	8.43	11.04	12.96	13.07
	(10.43)	(10.50)	(10.19)	(10.64)	(10.71)	(10.11)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	-7.56	-9.03	-5.32	-5.36	-5.81	-8.79
	(10.18)	(10.82)	(10.15)	(10.32)	(10.19)	(11.15)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-3.02	-4.49	-0.78	-0.81	-1.27	-4.24
	(9.63)	(9.57)	(10.15)	(10.19)	(9.69)	(10.52)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system})$	-19.91***	-19.91***	-19.91***	-19.91***	-19.91***	-19.91***
	(4.62)	(4.65)	(4.64)	(4.63)	(4.63)	(4.68)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system})$	-3.58	-3.58	-3.58	-3.58	-3.58	-3.58
	(5.59)	(5.63)	(5.61)	(5.61)	(5.60)	(5.67)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system})$	-15.36**	-15.36**	-15.36**	-15.36**	-15.36**	-15.36**
	(6.59)	(6.63)	(6.62)	(6.61)	(6.60)	(6.68)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}))$	16.32**	16.32**	16.32**	16.32**	16.32**	16.32**
	(7.25)	(7.30)	(7.29)	(7.27)	(7.27)	(7.36)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}))$	4.54	4.54	4.54	4.54	4.54	4.54
	(8.05)	(8.11)	(8.09)	(8.07)	(8.07)	(8.17)
Constant	128.56***	202.59***	106.75***	135.18***	133.15***	171.31***
	(6.99)	(24.23)	(29.49)	(10.02)	(7.85)	(36.54)
COVARIATES						
Demographics	NO	YES	NO	NO	NO	YES
Preferences	NO	NO	YES	NO	NO	YES
Prescription behaviour	NO	NO	NO	YES	NO	YES
Entrepreneurship preferences	NO	NO	NO	NO	YES	YES
Order effect	NO	YES	YES	YES	YES	YES
Observations	912	912	912	912	912	912
Number of id	152	152	152	152	152	152
Individual random effects	YES	YES	YES	YES	YES	YES

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

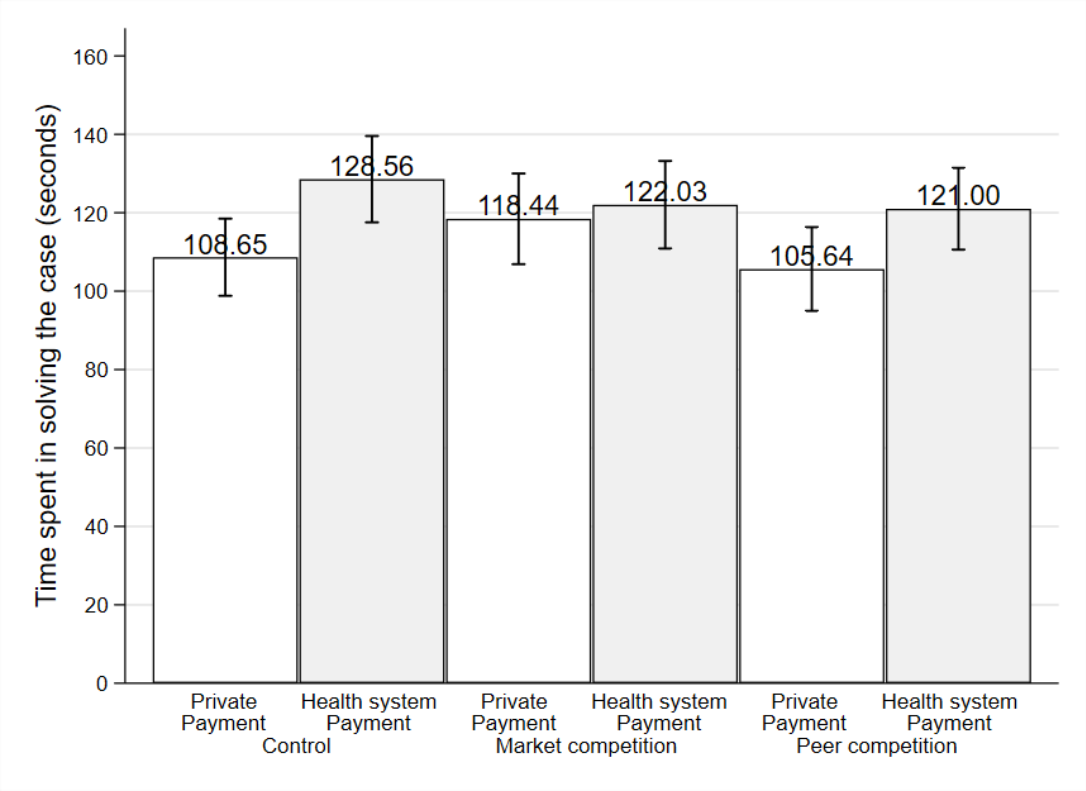
The complete regression could be found in the annex.

Source: Authors' elaboration.

The average time spent in solving the case in the control and health system payment group was 128 seconds (see second bar in Figure 17). The outcome variable, time spent in solving the case, captures the time in seconds that each doctor spends in solving the medical case (including both diagnosis and prescription). Notice that the results include different sets of covariates as controls such as demographics variables, preferences, prescription behaviour, and entrepreneurship preferences. The results also include a dummy variable to control for order effects for within-subject conditions. The last column in the table shows the result of the estimation with all the control variables.

Table 36 and Figure 17 show **that there is a negative effect of being under private payment with respect to health system payment scheme in the control condition, in particular, the time is reduced by 19 seconds.** In the same way, **being under private payment scheme reduces the time spent in solving the case by 15 seconds with respect to health system payment scheme under peer competition.**

Figure 17 - Treatment effects on the time spent in solving the case



Source: Authors' elaboration.

Figure 18 and Table 37 show that the main effect of private payment scheme is -12 seconds. This is, **being under private payment scheme reduces by 12 seconds the time spent in solving the medical case with respect to being under the health payment scheme[43].** Notice that the interpretation of this result, unlike the one presented in the treatment effects model above, is that the comparison with the health system payment scheme includes the three between-subject experimental conditions (i.e. control, market competition, peer competition), not only the control condition and peer competition.

Table 37 - Main effect on the time spent in solving the case

Experimental condition	Main effect on the time spent in solving the case					
	(1)	(2)	(3)	(4)	(5)	(6)
Between-subject conditions						
Market competition	1.63	4.86	0.27	2.88	4.80	4.91

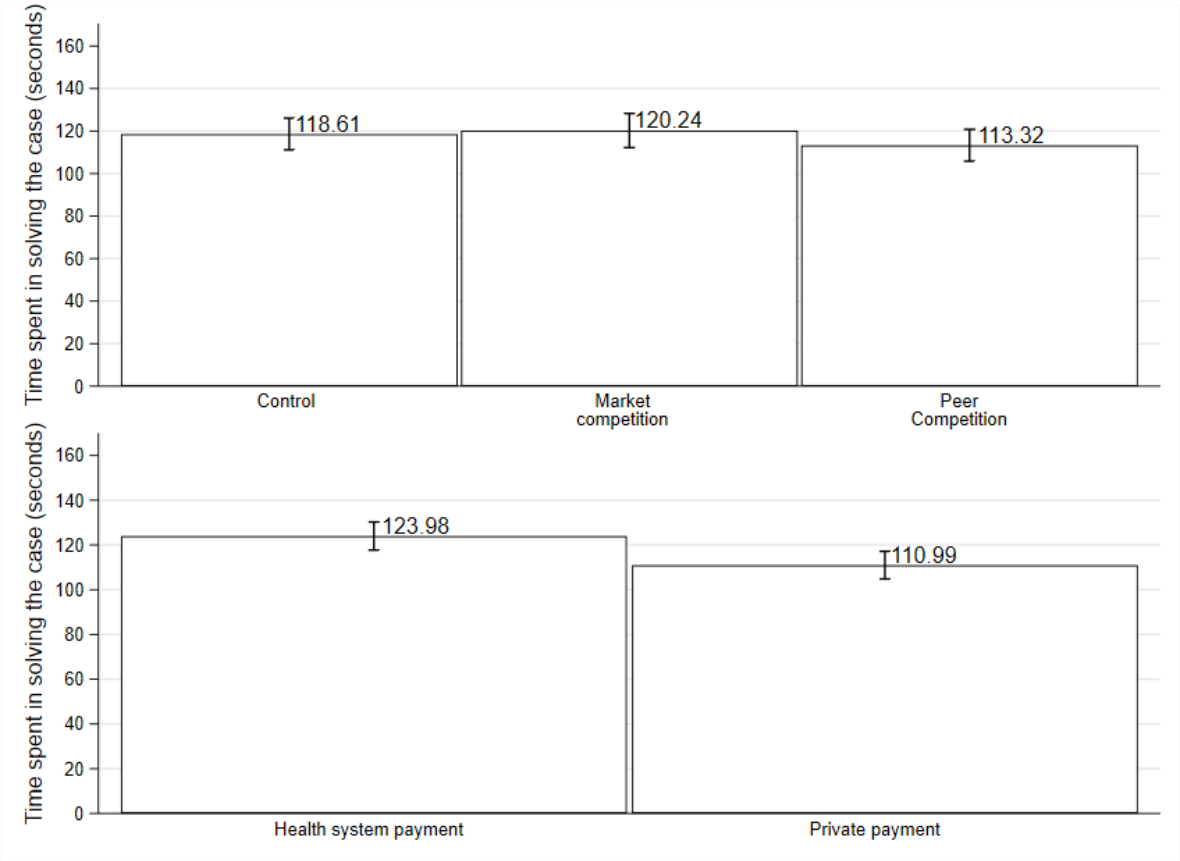
[43] Caveat: Although cases are expected to be well-balanced between within-subject conditions (i.e., private and health system schemes), the within-subject effect could potentially be influenced by differences in the level of difficulty in the medical cases. With the actual design it is not possible to identify if the effect is driven by treatment effect or by the level of difficulty.

Experimental condition	Main effect on the time spent in solving the case					
	(1)	(2)	(3)	(4)	(5)	(6)
Between-subject conditions						
	(9.66)	(9.54)	(9.31)	(9.76)	(9.88)	(9.22)
Peer competition	-5.29	-6.76	-3.05	-3.09	-3.54	-6.51
	(9.05)	(9.37)	(9.30)	(9.42)	(9.08)	(10.03)
Within-subject condition						
Private payment	-12.99***	-12.99***	-12.99***	-12.99***	-12.99***	-12.99***
	(3.28)	(3.30)	(3.29)	(3.29)	(3.28)	(3.33)

Note: for the between-subject conditions the comparison is with respect to the control experimental condition. On the other hand, for the within-subject experimental condition the comparison is with respect to the health system payment condition.

Source: Authors' elaboration.

Figure 18 - Main treatment effects on the time spent in solving the case



Source: Authors' elaboration.

Impact of the experimental conditions on the likelihood of getting the high bonus

The outcome variable is the likelihood of getting the high bonus for productivity in the experiment. This is a dummy variable that has the value of 1 if the doctor wins the high bonus for productivity (i.e. if resolved the medical case in less than 2 minutes), otherwise, the value is 0. To capture the impact of the experimental conditions on the likelihood of getting the high bonus by doctors in the experiment, we report two tables. Table 38 shows the results of the estimation of the model with interactions and Table 39 shows the model with the main effects of the experimental conditions.

Notice that the results include different sets of covariates as controls such as demographics variables, preferences, prescription behaviour, and entrepreneurship preferences. The results also include a dummy variable to control for order effects for within-subject conditions. The last column in the table shows the result of the estimation with all the control variables.

Table 38 - Treatment effect on likelihood of getting the high bonus

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	-0.02	-0.04	-0.01	-0.03	-0.04	-0.03
	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)	(0.07)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	-0.03	-0.03	-0.05	-0.02	-0.04	-0.05
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	0.02	0.03	0.01	0.01	0.01	0.04
	(0.07)	(0.08)	(0.07)	(0.07)	(0.07)	(0.08)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	0.07	0.07	0.06	0.05	0.06	0.08
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system})$	0.05	0.05	0.05	0.05	0.05	0.05
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system})$	0.04	0.04	0.04	0.04	0.04	0.04
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system})$	0.10**	0.10**	0.10**	0.10**	0.10**	0.10**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}))$	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}))$	0.05	0.05	0.05	0.05	0.05	0.05
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Constant	0.59***	0.11	0.79***	0.54***	0.56***	0.35
	(0.05)	(0.18)	(0.22)	(0.07)	(0.06)	(0.28)
COVARIATES						
Demographics	NO	YES	NO	NO	NO	YES
Preferences	NO	NO	YES	NO	NO	YES
Prescription behaviour	NO	NO	NO	YES	NO	YES
Entrepreneurship preferences	NO	NO	NO	NO	YES	YES
Order effect	NO	YES	YES	YES	YES	YES
Observations	912	912	912	912	912	912
Number of id	152	152	152	152	152	152
Individual random effects	YES	YES	YES	YES	YES	YES

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

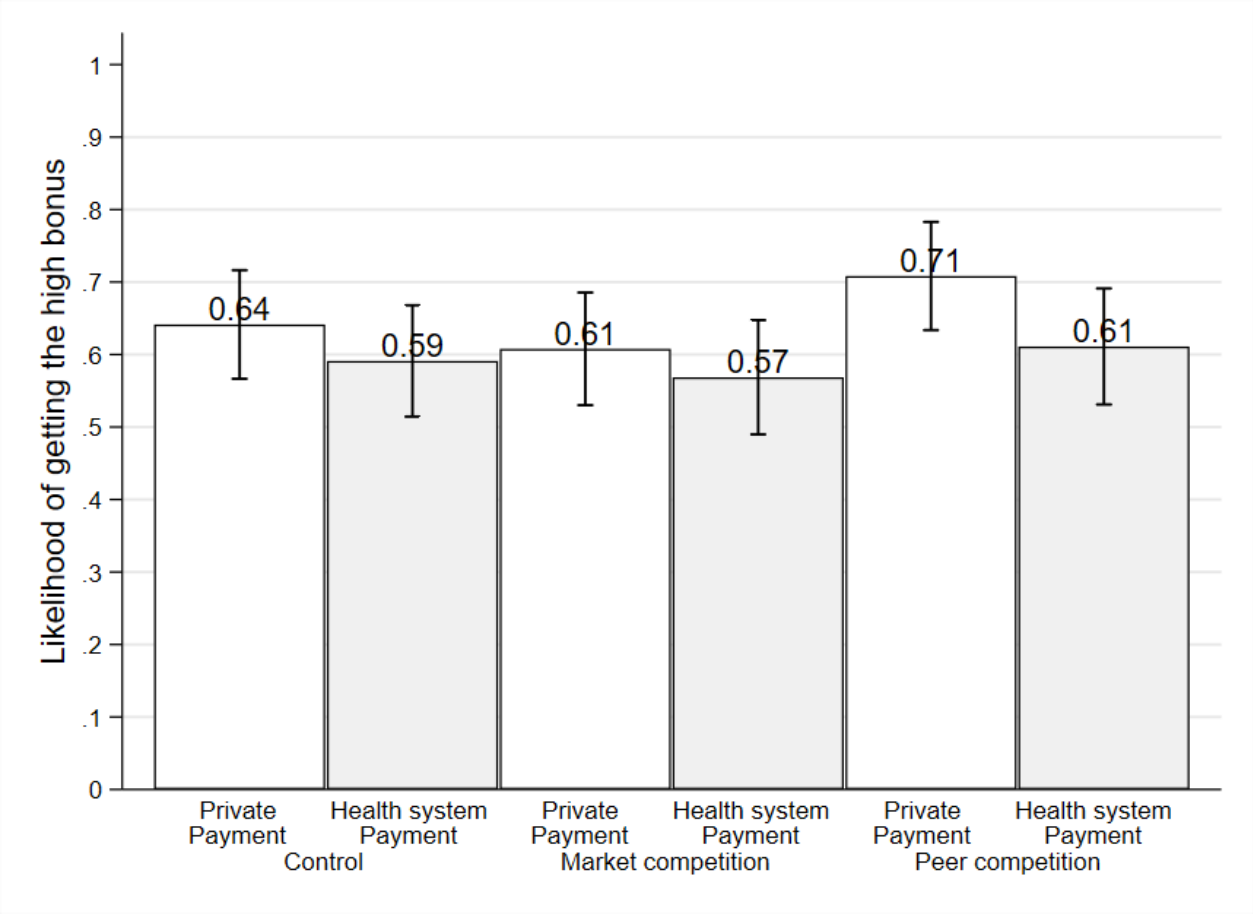
The complete regression could be found in the annex.

Source: Authors' elaboration.

The average value of the likelihood of getting the high bonus in the control and health system

payment conditions is 59%. Table 38 and Figure 19 **show that being under the private payment scheme increases the likelihood of getting the high bonus** by 10% with respect to being under the health system payment scheme in peer competition.

Figure 19 - Treatment effect on likelihood of getting the high bonus



Source: Authors' elaboration.

The main effect of the private payment scheme is 6%[44]. This means, being under private payment scheme increases the probability of getting the high bonus by 6% with respect to health system payment scheme. Notice that the interpretation of this result, unlike the one presented in the treatment effects model above, is that the comparison with the health system payment scheme includes the three between-subject experimental conditions (i.e. control, market competition, peer competition), not only the peer competition**.** These results are also shown in Figure 20.

[44] Caveat: Although cases are expected to be well-balanced between within-subject conditions (i.e., private and health system schemes), the within-subject effect could potentially be influenced by differences in the level of difficulty in the medical cases. With the actual design it is not possible to identify if the effect is driven by treatment effect or by the level of difficulty.

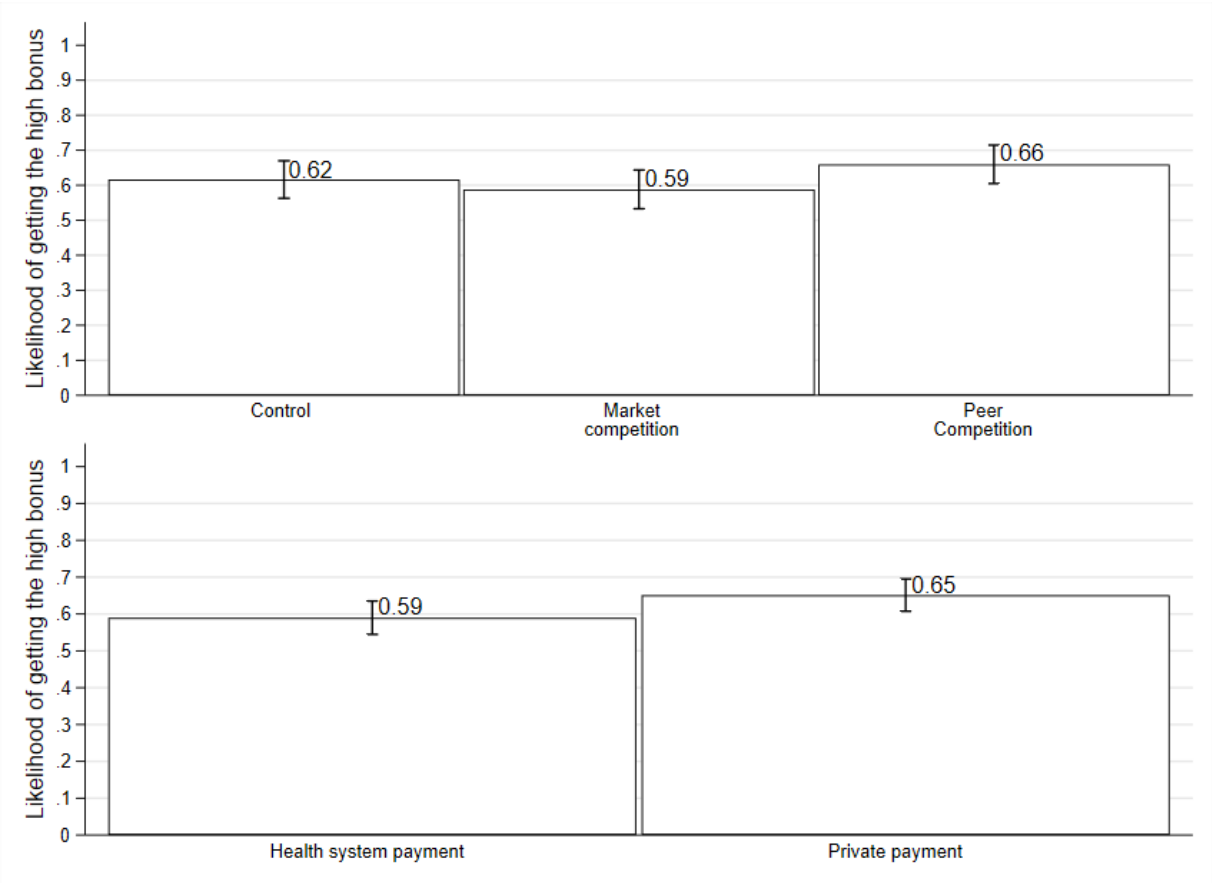
Table 39 - Main effect on likelihood of getting the high bonus

Experimental condition	Main effect on likelihood of getting the high bonus					
	(1)	(2)	(3)	(4)	(5)	(6)
Between-subject conditions						
Market competition	-0.03	-0.05	-0.01	-0.04	-0.04	-0.03
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Peer competition	0.04	0.05	0.03	0.03	0.04	0.06
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Within-subject condition						
Private payment	0.06**	0.06**	0.06**	0.06**	0.06**	0.06**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)

Note: for the between-subject conditions the comparison is with respect to the control experimental condition. On the other hand, for the within-subject experimental condition the comparison is with respect to the health system payment condition.

Source: Authors' elaboration.

Figure 20 - Main effects on likelihood of getting the high bonus



Source: Authors' elaboration.

Impact of the experimental conditions on the likelihood of getting at least one bonus

The outcome variable is the likelihood of getting at least one bonus for productivity in the experiment. This is a dummy variable that has the value of 1 if the doctor wins the low bonus for productivity (i.e. if resolved the medical case between 2-4 minutes) or wins the high bonus for productivity (i.e. if resolved the medical case in less than 2 minutes), otherwise, the value is 0. To capture the impact of the experimental conditions on the likelihood of getting at least one bonus by doctors in the experiment, we report two tables. Table 40 shows the results of the estimation of the model with interactions and Table 41 shows the model with the main effects of the experimental conditions.

Notice that the results include different sets of covariates as controls such as demographics variables, preferences, prescription behaviour, and entrepreneurship preferences. The results also include a dummy variable to control for order effects for within-subject conditions. The last column in the table shows the result of the estimation with all the control variables.

Table 40 - Treatment effect on likelihood of getting at least one bonus

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	0.01	-0.00	0.02	0.00	0.01	-0.00
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	-0.01	-0.03	-0.01	-0.03	-0.02	-0.03
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	0.02	0.03	0.01	0.02	0.02	0.03
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-0.01	-0.00	-0.02	-0.02	-0.02	-0.00
	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system})$	0.04	0.04	0.04	0.04	0.04	0.04
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system})$	0.01	0.01	0.01	0.01	0.01	0.01
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system})$	0.01	0.01	0.01	0.01	0.01	0.01

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}))$	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}))$	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Constant	0.87***	0.65***	0.92***	0.84***	0.86***	0.75***
	(0.04)	(0.10)	(0.12)	(0.05)	(0.04)	(0.16)
COVARIATES						
Demographics	NO	YES	NO	NO	NO	YES
Preferences	NO	NO	YES	NO	NO	YES
Prescription behaviour	NO	NO	NO	YES	NO	YES
Entrepreneurship preferences	NO	NO	NO	NO	YES	YES
Order effect	NO	YES	YES	YES	YES	YES
Observations	912	912	912	912	912	912
Number of id	152	152	152	152	152	152
Individual random effects	YES	YES	YES	YES	YES	YES

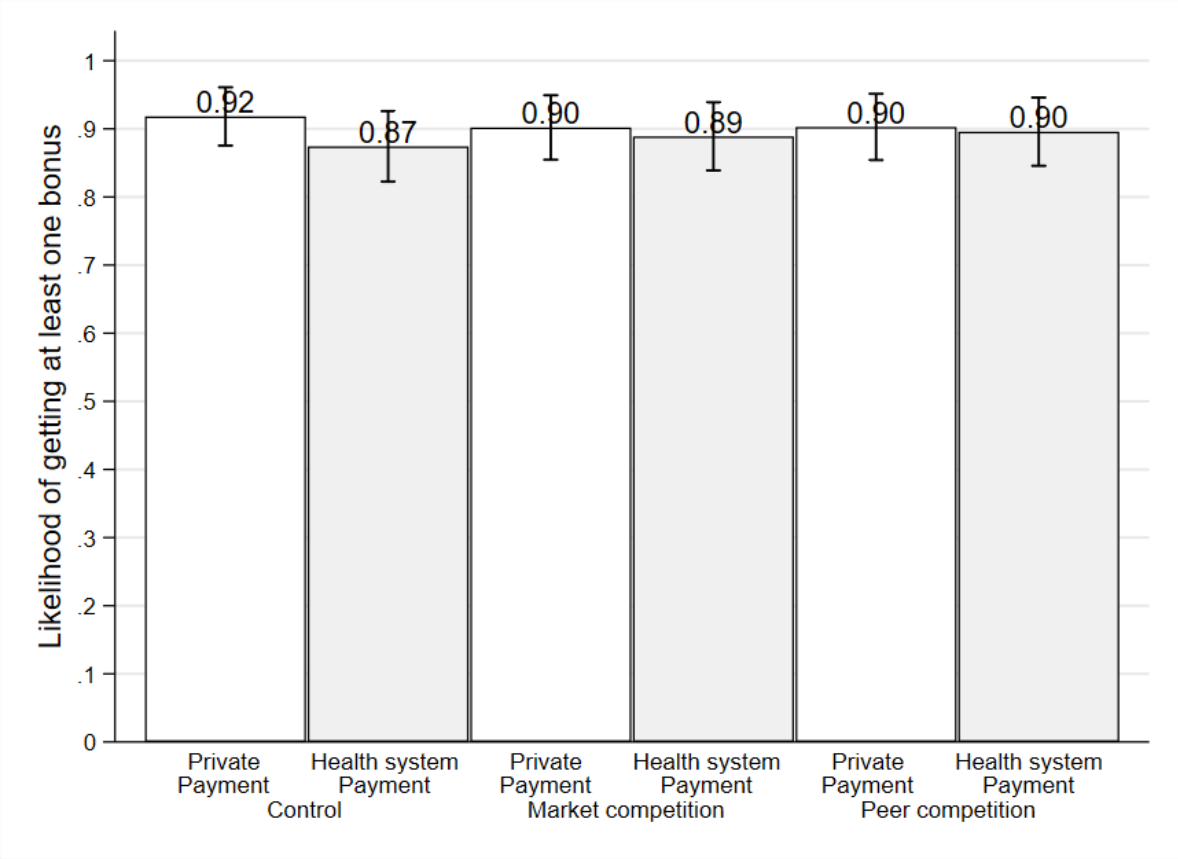
Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

The complete regression could be found in the annex.

Source: Authors' elaboration.

The average value of the likelihood of getting at least one bonus in the control and health system payment conditions is 87%. Table 40 and Figure 21 show that **there is no statistical effect on getting at least one bonus in any of the experimental conditions.**

Figure 21 - Treatment effect on likelihood of getting at least one bonus



Source: Authors' elaboration.

There is no main effect in any of the experimental conditions. This result is also shown in Source: *Authors' elaboration.*

Figure 22.

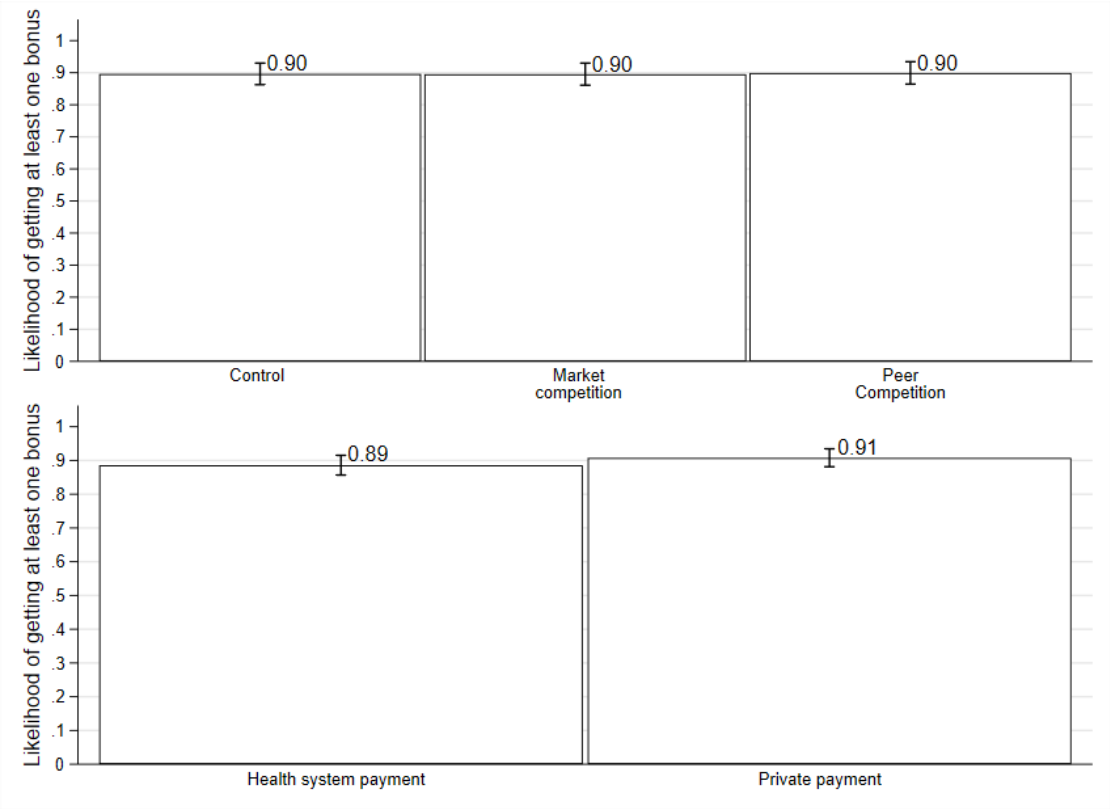
Table 41 - Main effect on likelihood of getting at least one bonus

Experimental condition	Main effect on likelihood of getting at least one bonus					
	(1)	(2)	(3)	(4)	(5)	(6)
Between-subject conditions						
Market competition	-0.00	-0.02	0.00	-0.01	-0.01	-0.02
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Peer competition	0.00	0.01	-0.01	-0.00	-0.00	0.01
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Within-subject condition						

Experimental condition	Main effect on likelihood of getting at least one bonus					
	(1)	(2)	(3)	(4)	(5)	(6)
Private payment	0.02	0.02	0.02	0.02	0.02	0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Note: for the between-subject conditions the comparison is with respect to the control experimental condition. On the other hand, for the within-subject experimental condition the comparison is with respect to the health system payment condition.						

Source: Authors' elaboration.

Figure 22 - Main effects on likelihood of getting at least one bonus



Source: Authors' elaboration.

Quality of service

To ensure a comprehensive approach to the quality of service, we have used different measures, namely: the likelihood of getting a correct diagnosis, the likelihood of getting a correct prescription, and the likelihood of prescribing generic drugs.

Impact of the experimental conditions on the likelihood of getting a correct diagnosis

The outcome variable is the likelihood of getting a correct diagnosis in the experiment. This is a dummy variable that has the value of 1 if the doctor correctly makes the diagnosis of the medical case, otherwise, the value is 0. To capture the impact of the experimental conditions on the likelihood of getting a correct diagnosis by the doctors in the experiment, we report

two tables. Table 42 shows the results of the estimation of the model with interaction and Table 43 shows the results of the model with the main effects of the experimental conditions.

Notice that the results include different sets of covariates as controls such as demographics variables, preferences, prescription behaviour, and entrepreneurship preferences. The results also include a dummy variable to control for order effects for within-subject conditions. The last column in the table shows the result of the estimation with all the control variables.

Table 42 - Treatment effect on likelihood of getting a correct diagnosis

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	-0.06	-0.06	-0.05	-0.06	-0.06	-0.04
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	-0.02	-0.02	-0.00	-0.02	-0.02	0.00
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	-0.03	-0.06	-0.03	-0.03	-0.03	-0.06
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-0.06	-0.09*	-0.06	-0.06	-0.06	-0.09*
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system})$	-0.13***	-0.13***	-0.13***	-0.13***	-0.13***	-0.13**
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system})$	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system})$	-0.17***	-0.17***	-0.17***	-0.17***	-0.17***	-0.17***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}))$	0.04	0.04	0.04	0.04	0.04	0.04
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}))$	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Constant	0.51***	0.47***	0.34***	0.51***	0.52***	0.23
	(0.04)	(0.10)	(0.12)	(0.05)	(0.04)	(0.15)
COVARIATES						
Demographics	NO	YES	NO	NO	NO	YES
Preferences	NO	NO	YES	NO	NO	YES
Prescription behaviour	NO	NO	NO	YES	NO	YES
Entrepreneurship Preferences	NO	NO	NO	NO	YES	YES
Order effect	NO	YES	YES	YES	YES	YES
Observations	912	912	912	912	912	912
Number of id	152	152	152	152	152	152
Individual random effects	YES	YES	YES	YES	YES	YES

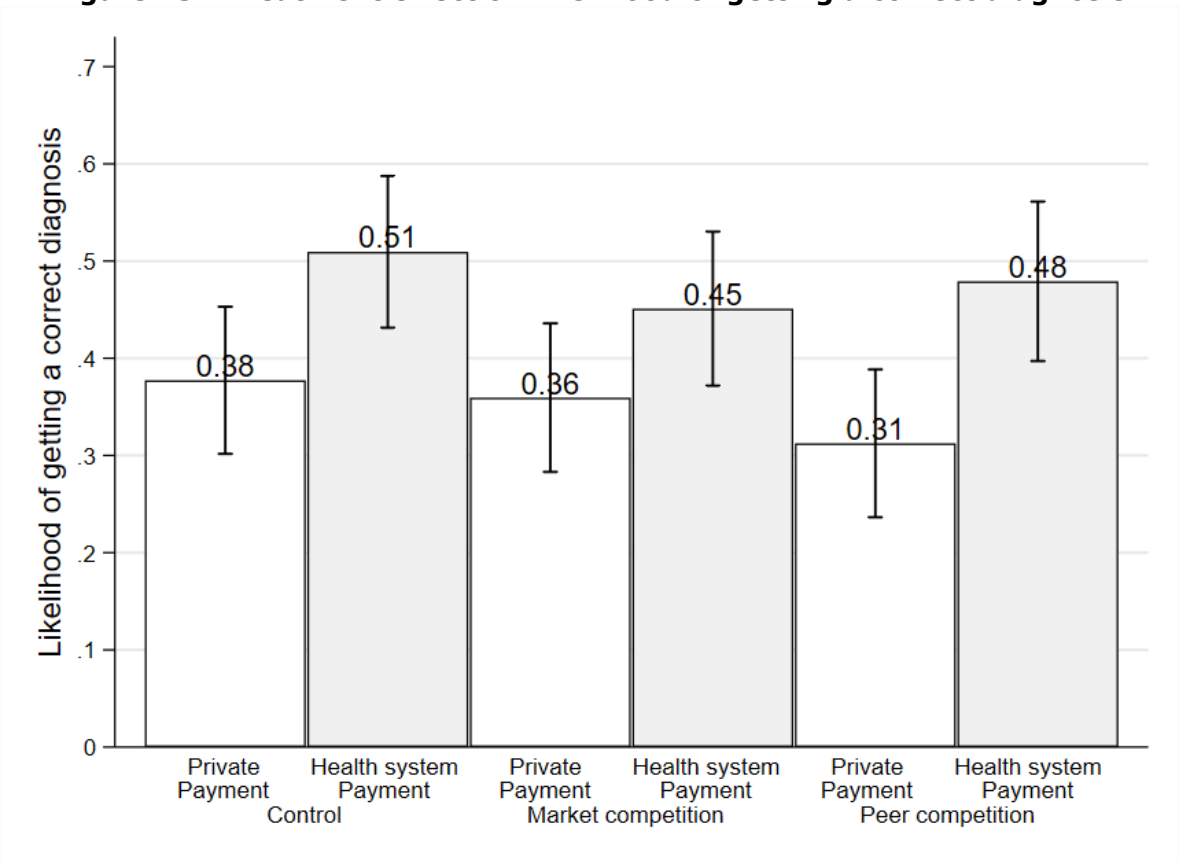
Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

The complete regression could be found in the annex.

Source: Authors' elaboration.

The average value of the likelihood of getting a correct diagnosis in the control and health system payment conditions is 51%. The following results presented in Table 42 and Figure 23 show **that peer competition reduces (mild effect) the probability of getting a correct diagnosis** by 9% under the private payment scheme with respect to the control condition. Being under the private payment scheme reduces the likelihood of getting a correct diagnosis by 13% with respect to being under the health system payment scheme in the control condition. Finally, being under the private payment scheme reduces the likelihood of getting a correct diagnosis by 17% with respect to being under the health system payment scheme in peer competition.

Figure 23 - Treatment effect on likelihood of getting a correct diagnosis



Source: Authors' elaboration.

Figure 24 and Table 43 show that the private payment scheme has a negative main effect of -13%. **This means that being under private payment scheme reduces the likelihood of getting a correct diagnosis by 13% with respect to health system payment scheme[45].** Notice that the interpretation of this result, unlike the one presented in the treatment effects model above, is that the comparison with the health system payment scheme includes the three between-subject experimental conditions (i.e. control, market competition, peer competition) on average and not by doing separate comparisons.

[45] Caveat: Although cases are expected to be well-balanced between within-subject conditions (i.e., private and health system schemes), the within-subject effect could potentially be influenced by differences in the level of difficulty in the medical cases. With the actual design it is not possible to identify if the effect is driven by treatment effect or by the level of difficulty.

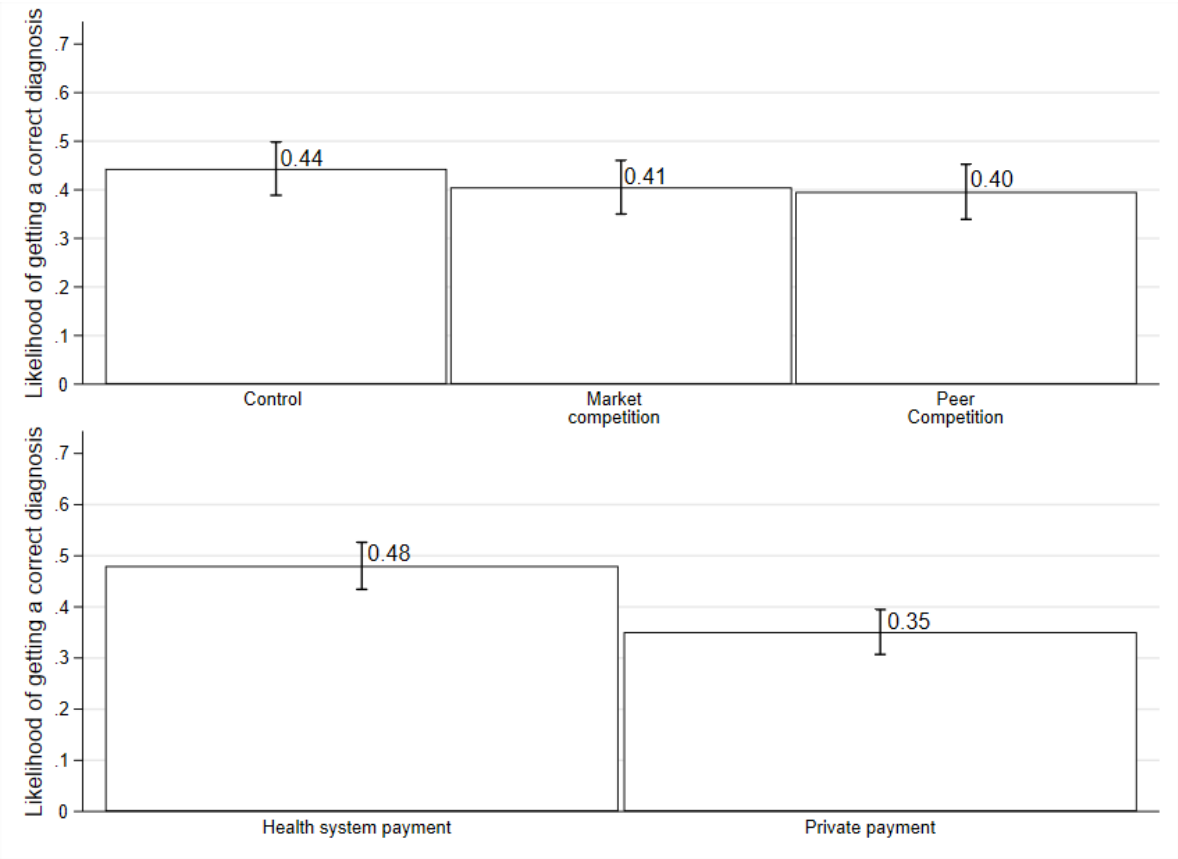
Table 43 - Main effect on likelihood of getting a correct diagnosis

Experimental condition	Main effect on likelihood of getting a correct diagnosis					
	(1)	(2)	(3)	(4)	(5)	(6)
Between-subject conditions						
Market competition	-0.04	-0.04	-0.03	-0.04	-0.04	-0.02
	(0.03)	(0.04)	(0.03)	(0.03)	(0.04)	(0.04)
Peer competition	-0.05	-0.07*	-0.05	-0.05	-0.05	-0.07
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Within-subject condition						
Private payment	-0.13***	-0.13***	-0.13***	-0.13***	-0.13***	-0.13***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)

Note: for the between-subject conditions the comparison is with respect to the control experimental condition. On the other hand, for the within-subject experimental condition the comparison is with respect to the health system payment condition.

Source: Authors' elaboration.

Figure 24 - Main treatment effects on likelihood of getting a correct diagnosis



Source: Authors' elaboration.

Impact of the experimental conditions on the likelihood of getting a correct prescription

The outcome variable is the likelihood of getting a correct prescription in the experiment. This is a dummy variable that has the value of 1 if the doctor correctly makes the prescription of the medical case, otherwise, the value is 0. To capture the impact of the experimental conditions on the likelihood of getting a correct prescription by doctors in the experiment, we report two tables. Table 44 shows the results of the estimation of the model with interactions and Table 45 shows the results of the model with the main effects of the experimental conditions.

Notice that the results include different sets of covariates as controls such as demographics variables, preferences, prescription behaviour, and entrepreneurship preferences. The results also include a dummy variable to control for order effects for within-subject conditions. The last column in the table shows the result of the estimation with all the control variables.

Table 44 - Treatment effect on likelihood of getting a correct prescription

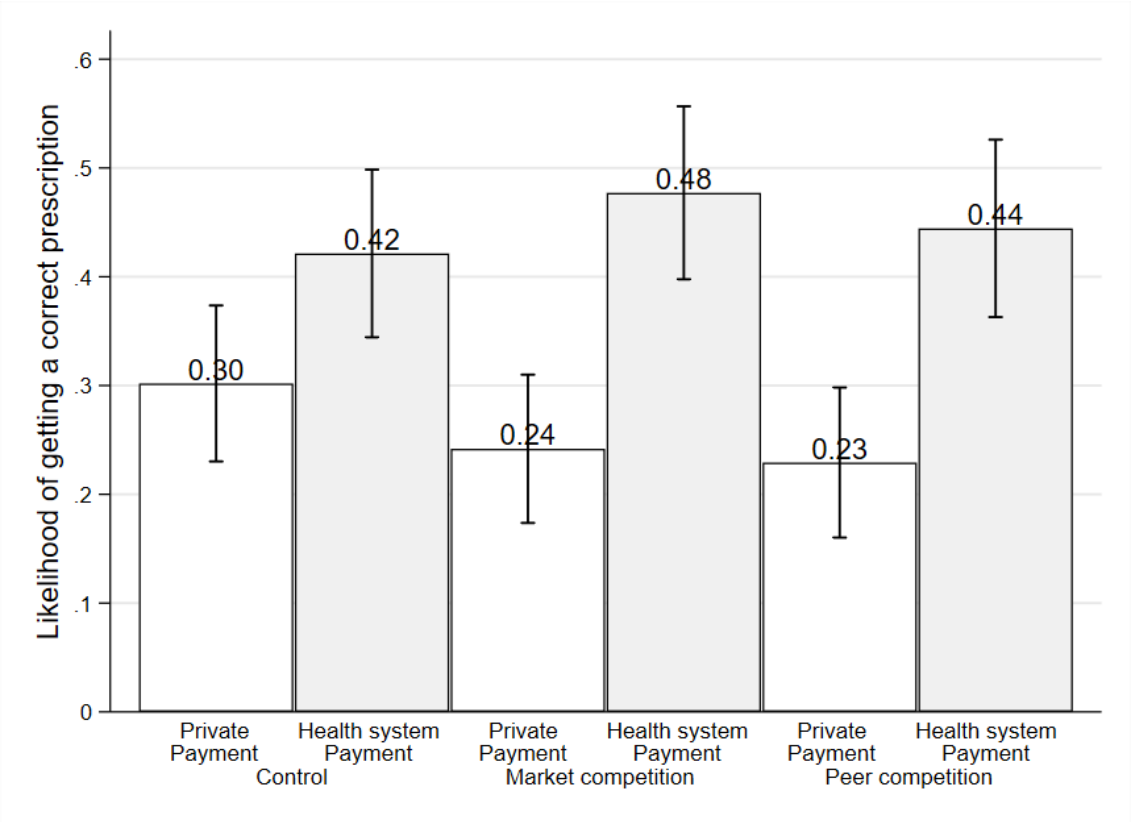
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ syste}$	0.06	0.04	0.06	0.05	0.06	0.05
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ syste}$	0.02	0.02	0.01	0.00	0.02	-0.00
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-0.07	-0.08*	-0.09*	-0.09**	-0.07	-0.10**
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ syste}$	-0.12**	-0.12**	-0.12**	-0.12**	-0.12**	-0.12**
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ syste}$	-0.24***	-0.24***	-0.24***	-0.24***	-0.24***	-0.24***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ syste}$	-0.22***	-0.22***	-0.22***	-0.22***	-0.22***	-0.22***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ syst} - E(Y_{control}^{health\ syste}$	-0.12*	-0.12*	-0.12*	-0.12*	-0.12*	-0.12*
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ syst} - E(Y_{control}^{health\ syste}$	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**
Constant	0.42***	0.35***	0.44***	0.37***	0.42***	0.34**
	(0.03)	(0.11)	(0.12)	(0.05)	(0.04)	(0.14)
COVARIATES						
Demographics	NO	YES	NO	NO	NO	YES
Preferences	NO	NO	YES	NO	NO	YES
Prescription behaviour	NO	NO	NO	YES	NO	YES
Entrepreneurship preferences	NO	NO	NO	NO	YES	YES
Order effect	NO	YES	YES	YES	YES	YES
Observations	912	912	912	912	912	912
Number of id	152	152	152	152	152	152
Individual random effects	YES	YES	YES	YES	YES	YES
Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. The complete regression could be found in the annex.						

Source: Authors' elaboration.

The average value of the likelihood of getting a correct prescription in the control and health system payment conditions is 42%. The following results are shown in Table 44 and Figure 25. **Peer competition reduces the probability of getting a correct prescription, on average, by 10% with respect to control condition under private payment scheme. There is a negative effect of being under private payment scheme with respect to health system payment scheme in all the between-subject conditions, namely: control, -12%; market competition, -24%; peer competition, -22%.**

Figure 25 - Treatment effect on likelihood of getting a correct prescription



Source: Authors' elaboration.

Table 45 and Figure 26 show that **the main effect of private payment condition is -19%[46]. This means being under private payment scheme reduces the likelihood of getting a correct prescription by 19% with respect to being under health system payment scheme.**

Table 45 - Main effect on likelihood of getting a correct prescription

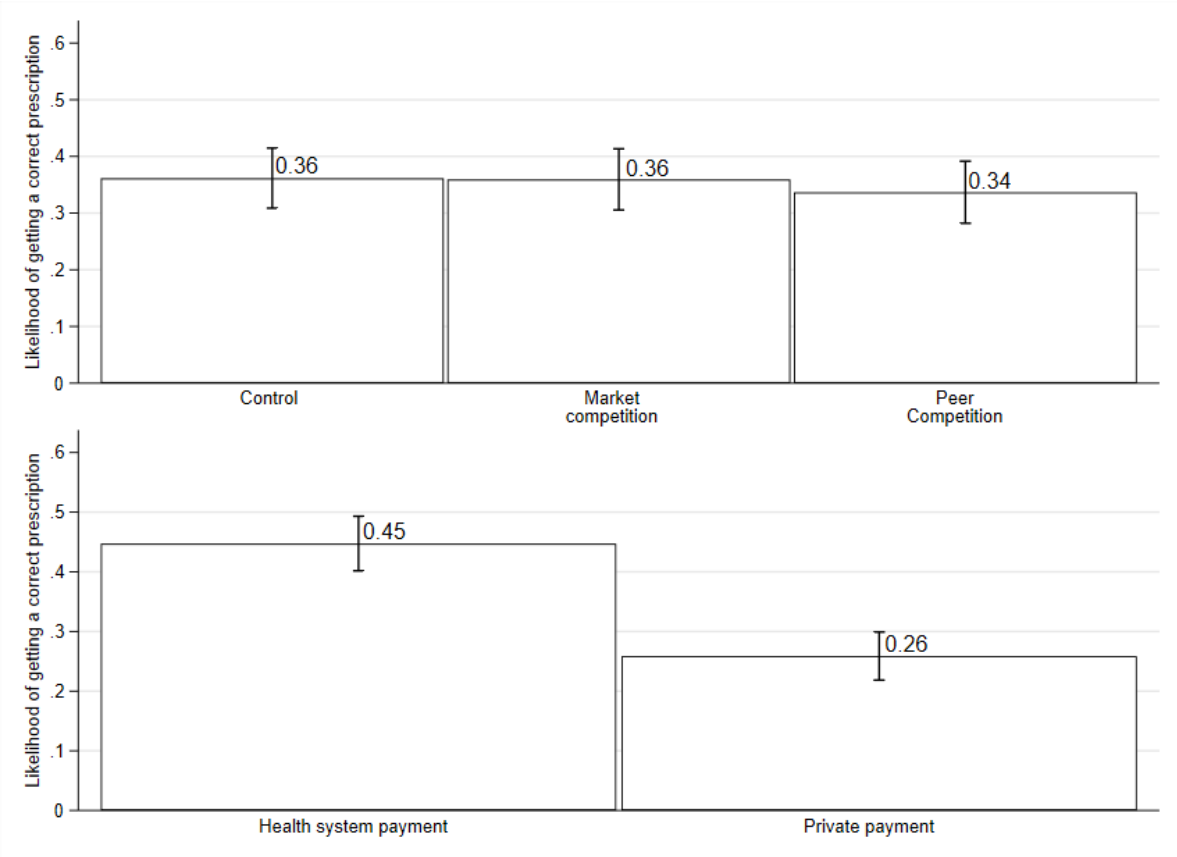
Experimental condition	Main effect on likelihood of getting a correct prescription					
	(1)	(2)	(3)	(4)	(5)	(6)
Between-subject conditions						
Market competition	-0.00	-0.02	0.00	-0.01	0.00	-0.00
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Peer competition	-0.02	-0.03	-0.04	-0.05	-0.02	-0.05
	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)
Within-subject condition						

[46] Caveat: Although cases are expected to be well-balanced between within-subject conditions (i.e., private and health system schemes), the within-subject effect could potentially be influenced by differences in the level of difficulty in the medical cases. With the actual design it is not possible to identify if the effect is driven by treatment effect or by the level of difficulty.

Private payment	-0.19***	-0.19***	-0.19***	-0.19***	-0.19***	-0.19***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Note: for the between-subject conditions the comparison is with respect to the control experimental condition. On the other hand, for the within-subject experimental condition the comparison is with respect to the health system payment condition.						

Source: Authors' elaboration.

Figure 26 - Main effect on likelihood of getting a correct prescription



Source: Authors' elaboration.

Impact of the experimental conditions on the likelihood of prescribing generic drugs

The outcome variable is the likelihood of prescribing generic drugs in the experiment. This is a dummy variable that has the value of 1 if the doctor prescribes a generic drug in the medical prescription, otherwise, the value is 0. To capture the impact of the experimental conditions on the likelihood of prescribing generic drugs by doctors in the experiment, we report two tables. Table 46 shows the results of the estimation of the model with interactions and Table 47 shows the model with the main effects of the experimental conditions.

Notice that the results include different sets of covariates as controls such as demographics variables, preferences, prescription behaviour, and entrepreneurship preferences. The results also include a dummy variable to control for order effects for within-subject conditions. The last column in the table shows the result of the estimation with all the control variables.

Table 46 - Treatment effect on likelihood of prescribing generic drugs

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}$	0.01	0.01	0.01	0.00	0.03	0.03
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	0.06**	0.07**	0.06**	0.06**	0.08***	0.08***
	(0.03)	(0.05)	(0.03)	(0.03)	(0.03)	(0.03)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}$	0.08	0.07	0.07	0.08	0.08	0.07
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-0.02	-0.02	-0.03	-0.01	-0.02	-0.03
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system}$	0.18***	0.18***	0.18***	0.18***	0.18***	0.18***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system}$	0.23***	0.23***	0.23***	0.23***	0.23***	0.23***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system}$	0.08*	0.08*	0.08*	0.08*	0.08*	0.08*
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ syster} - E(Y_{control}^{health\ system}$	0.05	0.05	0.05	0.05	0.05	0.05
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ syster} - E(Y_{control}^{health\ system}$	-0.10*	-0.10	-0.10	-0.10*	-0.10*	-0.10

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Constant	0.72***	0.75***	0.68***	0.72***	0.73***	0.72***
	(0.04)	(0.10)	(0.10)	(0.04)	(0.04)	(0.13)
COVARIATES						
Demographics	NO	YES	NO	NO	NO	YES
Preferences	NO	NO	YES	NO	NO	YES
Prescription behaviour	NO	NO	NO	YES	NO	YES
Entrepreneurship preferences	NO	NO	NO	NO	YES	YES
Order effect	NO	YES	YES	YES	YES	YES
Observations	912	912	912	912	912	912
Number of id	152	152	152	152	152	152
Individual random effects	YES	YES	YES	YES	YES	YES

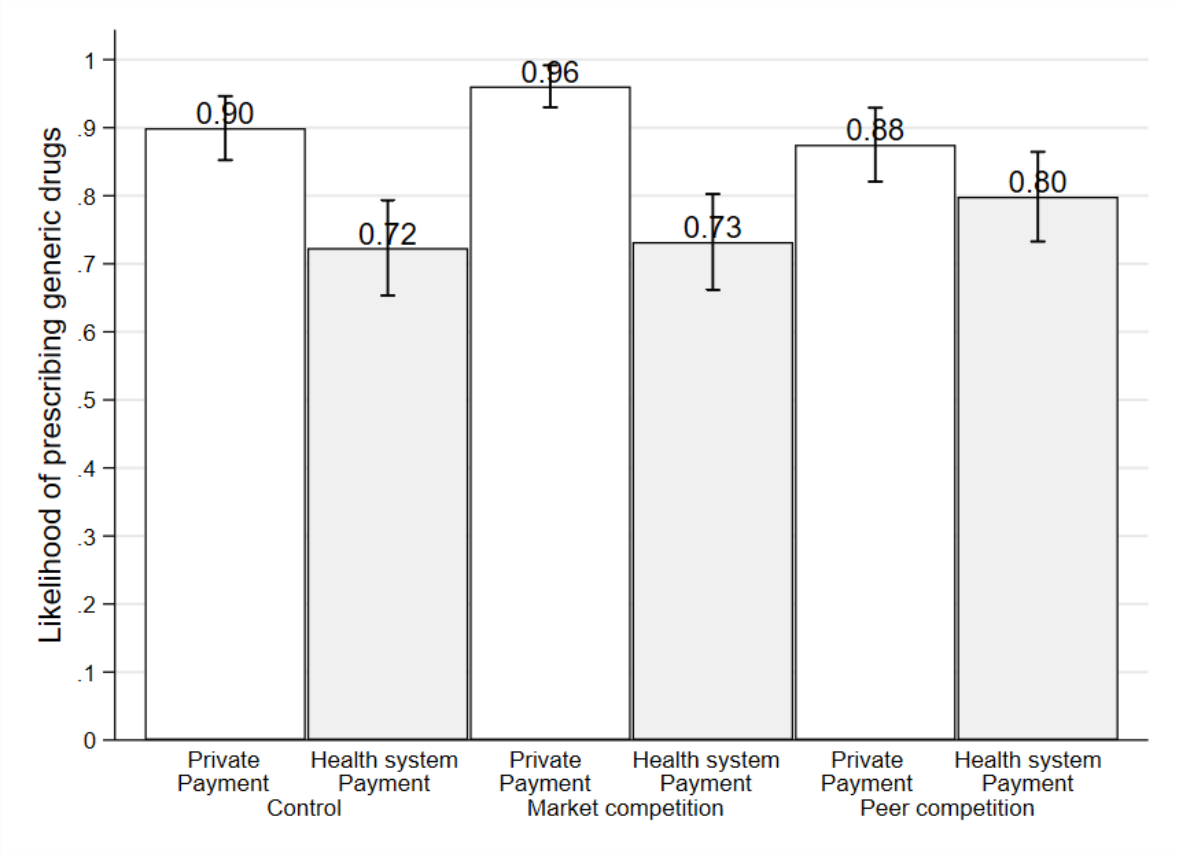
Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

The complete regression could be found in the annex.

Source: Authors' elaboration.

The average value of the likelihood of prescribing generic drugs in the control and health system payment conditions is 72%. The following results are shown in Table 46 and Figure 27. **Market competition increases the likelihood of prescribing a generic drug, on average, by 8% with respect to the control condition under the private payment scheme. There is a positive effect on generic drug prescription of being under private payment scheme with respect to being under health system payment scheme in all the between-subject conditions, namely: control, 18%; market competition, 23%; peer competition, 8%.**

Figure 27 - Treatment effect on likelihood of prescribing generic drugs



Source: Authors' elaboration.

The main effect of market competition is 6%. In other words, **market competition increases the likelihood of prescribing generic drugs, on average, by 5% with respect to control condition**. On the other hand, the main effect of private payment scheme is 16%. This means that **being under private payment scheme increases the likelihood of prescribing generic drugs, on average, by 16%[47].** Notice that the interpretation of this result, unlike the one presented in the treatment effects model above, is that the comparison with the health system payment scheme includes the three between-subject experimental conditions (i.e. control, market competition, peer competition) on average and not by doing separate comparisons.

Table 47 - Main effect on likelihood of prescribing a generic drug

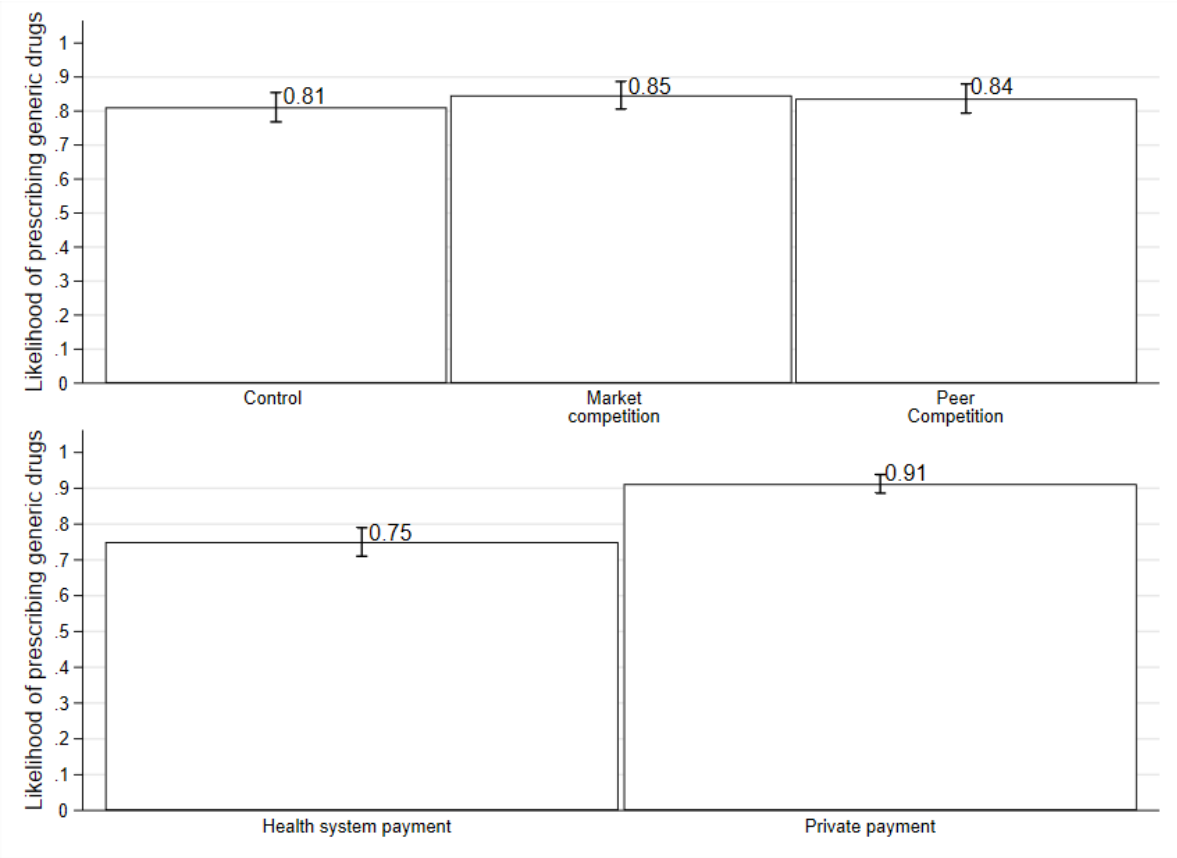
Experimental condition	Main effect on likelihood of prescribing a generic drug					
	(1)	(2)	(3)	(4)	(5)	(6)
Between-subject conditions						
Market competition	0.04	0.04	0.04	0.03	0.05*	0.06*
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)

[47] Caveat: Although cases are expected to be well-balanced between within-subject conditions (i.e., private and health system schemes), the within-subject effect could potentially be influenced by differences in the level of difficulty in the medical cases. With the actual design it is not possible to identify if the effect is driven by treatment effect or by the level of difficulty.

Experimental condition	Main effect on likelihood of prescribing a generic drug					
	(1)	(2)	(3)	(4)	(5)	(6)
Between-subject conditions						
Peer competition	0.03	0.02	0.02	0.04	0.03	0.02
	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)
Within-subject condition						
Private payment	0.16***	0.16***	0.16***	0.16***	0.16***	0.16***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Note: for the between-subject conditions the comparison is with respect to the control experimental condition. On the other hand, for the within-subject experimental condition the comparison is with respect to the health system payment condition.						

Source: Authors' elaboration.

Figure 28 - Main effect of likelihood of prescribing generic drugs



Source: Authors' elaboration.

4.2.2 Patient behaviour in The Netherlands

In this section we report the results of the estimation of our econometric model for patients. We report two outcome variables. The first is whether the patient follows or not the medical

prescription made by the doctor. This outcome variable is observed in all the experimental conditions. The second outcome variable is whether the patient in the market competition condition pays for a second diagnosis made by another doctor. For the second variable we compare the results between private payment scheme and health system payment scheme.

Table 48 shows the results of the estimation of the model with interactions and Table 49 shows the model with the main effects of the experimental conditions. Notice that the results include different sets of covariates as controls such as demographics variables, and preferences. The results also include a dummy variable to control for order effects for within-subject conditions. The last column in the table shows the result of the estimation with all the control variables.

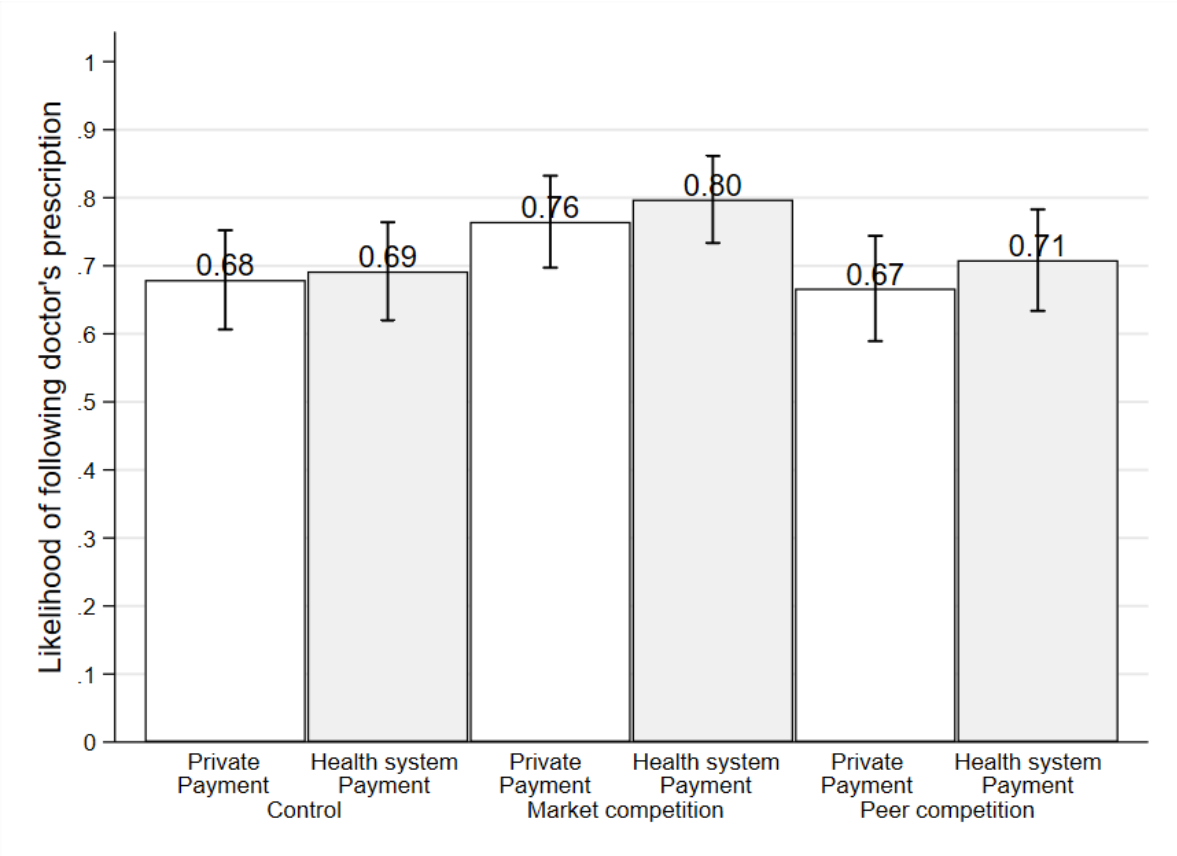
Table 48 - Treatment effect on likelihood of following doctor's prescription, the Netherlands

	(1)	(2)	(3)	(4)
VARIABLES	**P(following doctor prescription)**	**P(following doctor prescription)**	**P(following doctor prescription)**	**P(following doctor prescription)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	0.11*	0.11*	0.12**	0.13**
	(0.06)	(0.06)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	0.09	0.09*	0.10*	0.11**
	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	0.02	0.02	0.02	0.02
	(0.06)	(0.06)	(0.05)	(0.06)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-0.01	-0.00	-0.01	-0.00
	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system})$	-0.01	-0.01	-0.01	-0.01
	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system})$	-0.03	-0.03	-0.03	-0.03
	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system})$	-0.04	-0.04	-0.04	-0.04
	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}))$	-0.02	-0.02	-0.02	-0.02
	(0.07)	(0.07)	(0.07)	(0.07)

	(1)	(2)	(3)	(4)
VARIABLES	**P(following doctor prescription)**	**P(following doctor prescription)**	**P(following doctor prescription)**	**P(following doctor prescription)**
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}))$	-0.03	-0.03	-0.03	-0.03
	(0.07)	(0.07)	(0.07)	(0.07)
Constant	0.69***	0.73***	0.50***	0.58***
	(0.04)	(0.07)	(0.14)	(0.15)
Demographics	NO	YES	NO	YES
Preferences	NO	NO	YES	YES
Order effect	NO	YES	YES	YES
Observations	912	912	912	912
Number of id	152	152	152	152
Individual random effects	YES	YES	YES	YES

The average value of the likelihood of following a doctor prescription in the control and health system payment conditions is 69%. The following results are shown in Table 48 and Figure 29. **Market competition increases the probability of following doctor's prescription, on average, by 13% under health system payment scheme and by 11% under private payment scheme with respect to the control condition.**

Figure 29 - Treatment effect on likelihood of following doctor's prescription



Source: Authors' elaboration.

The main effect of market competition is 10%. In other words, **market competition increases the likelihood of following the doctor's prescription by 10% with respect to the control condition and by 10% with respect to the peer competition condition.** These results are also shown in Figure 30. This result could be interpreted as an increase in confidence in doctors in the presence of market competition. In general, there is a mismatch between the diagnosis and the prescriptions of the first doctor and that of the second doctor. In fact, there is only a 14.4% match for diagnosis and 10.9% for prescriptions, so it seems the effect is not driven by the fact the diagnosis and prescriptions are the same. Indeed, patients follow, on average, 10% more the first doctor's prescription when they pay for getting a second medical opinion with respect to the case when they did not pay for getting a second medical opinion (t = -2.03; p-value= 0.04).

Table 49 - Main effect of likelihood of following doctor's prescription, the Netherlands

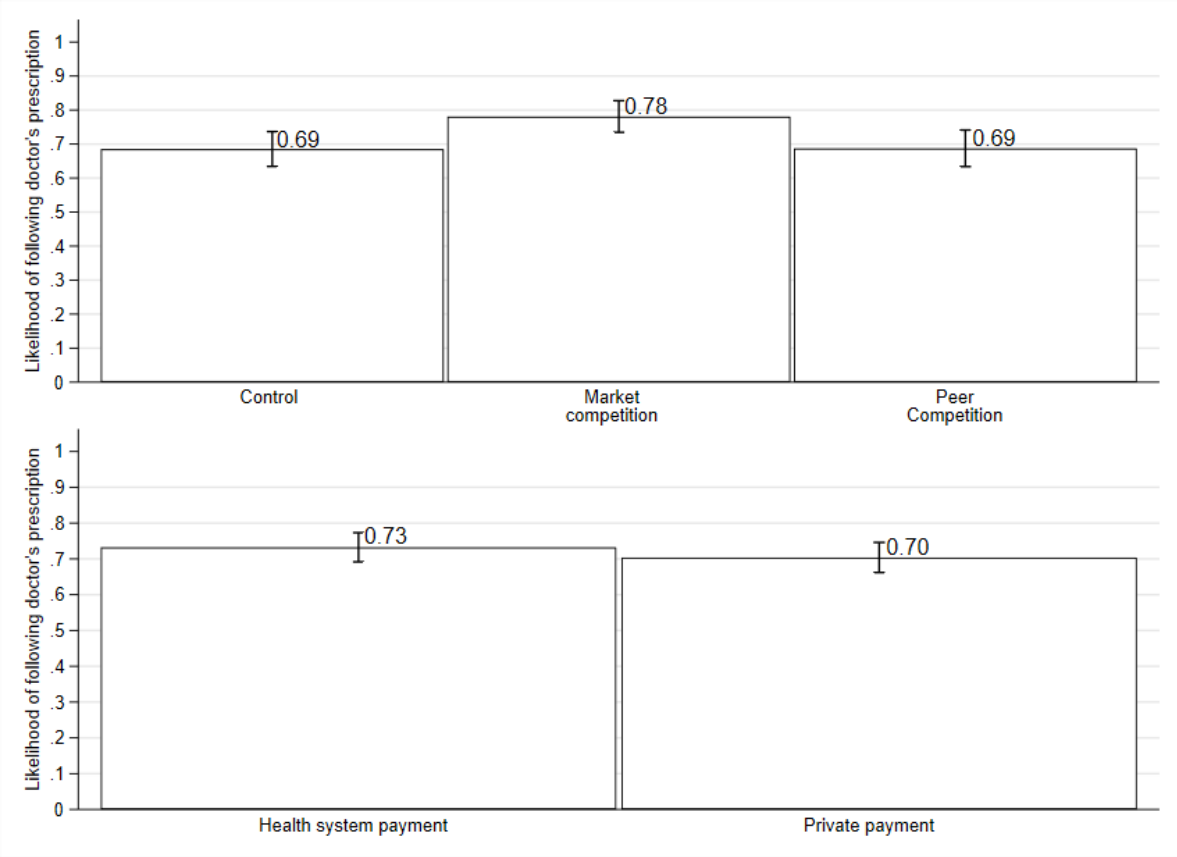
Experimental condition	Main effect on likelihood of following the doctor's prescription					
	(1)	(2)	(3)	(4)	(5)	(6)
Between-subject conditions						
Market competition	0.10**	0.10**	0.11***	0.12***	0.10**	0.10**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Peer competition	0.00	0.01	0.00	0.01	0.00	0.01

	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Within-subject condition						
Private payment	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)

Note: for the between-subject conditions the comparison is with respect to the control experimental condition. On the other hand, for the within-subject experimental condition the comparison is with respect to the health system payment condition.

Source: Authors' elaboration.

Figure 30 - Main effect of likelihood of following doctor's prescription

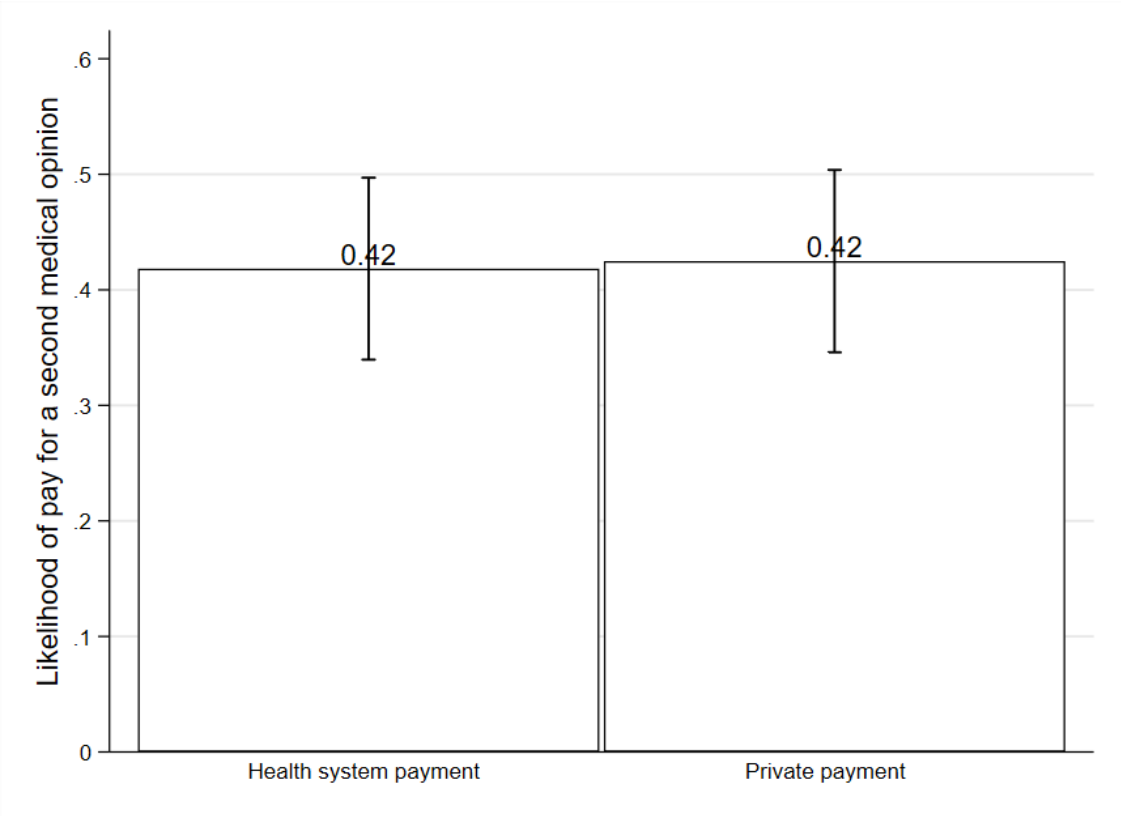


Source: Authors' elaboration.

Analysis for market competition treatment

There is no treatment effect of being under private payment scheme on the likelihood of paying for a second diagnosis with respect to being under health system payment scheme in the market competition condition. This result is presented in Figure 31.

Figure 31 - Comparison of the likelihood of paying for a second medical opinion between payment schemes



Source: Authors' elaboration.

4.3 Differences in the results between samples

To test if there is any statistical difference in the outcome variables between the countries, we pooled together all the observations and added a dummy variable for the observations from the Netherlands.

Table 50 shows the results of the estimation of the main effects for all the outcome variables, including the country dummy.

Each column indicates an effect (the first three columns on productivity, the second three on quality of services) of experimental conditions on the pool of observations for both Spain and the Netherlands, as well as the difference in each effect between the two countries.

While there is often no statistical significance, some results can be observed, such as:

- A **reduction** (by 16 seconds) in the **time spent in solving the medical case** under private payment scheme with respect to health system payment scheme (Column 1), suggesting an increased efficiency when the burden of payment is on the patient, but a decision to spend more time on each case rather than maximizing the number of cases solved when the system uses taxpayer money;
- a **positive main effect of market competition** on:
  - the probability of getting a correct prescription (5% - Column 5);
  - the probability of prescribing a generic drug (4% - Column 6);
- a **negative main effect of peer competition** on the probability of getting a correct diagnosis (-6%) (Column 4);
- a **negative main effect** of **private payment scheme** on

  - the probability of getting a correct diagnosis (-9% - Column 4)
  - the probability of getting a correct prescription (-9% - Column 5);
- a **positive main effect of being under private payment scheme** on:
  - the probability of getting the high bonus (9% - Column 2)
  - the probability of getting at least one bonus (2% - Column 3)
  - the probability of prescribing a generic drug (8% - Column 6).

Some of these pooled results are similar to the results shown in the individual country samples, namely:

- A **reduction**, by 20 seconds in Spain and by 12 seconds in the Netherlands, **in the time spent in solving the medical case** under private payment with respect to health system payment scheme;
- A **positive main effect of market competition** on:
  - The probability of getting a correct prescription in Spain (by 10%);
  - The probability of prescribing a generic drug in Spain (by 5%) and in the Netherlands (by 6%).
- A **positive main effect of being under private payment scheme** on:
  - The probability of getting the high bonus (by 12%) in Spain and (by 6%) in the Netherlands;
  - The probability of prescribing a generic drug in the Netherlands (by 16%).
- A **negative main effect of being under private payment scheme** on:
  - The probability of getting a correct diagnosis in Spain (by 6%) and in the Netherlands (by 13%).

However, the following result was found only in the Spain sample:

- A **negative main effect of market competition** on:
  - The probability of getting the high bonus (by 12%) in Spain.

Table 50 Main effect in outcome variables and differences between countries

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**Time spent in solving the case**	**P(get high bonus)**	**P(get low bonus)**	**P(Correct diagnosis)**	**P(Correct prescription)**	**P(prescribe generic drugs)**
$E(Y_{market}) - E(Y_{control})$	6.54	-0.05	-0.02	-0.01	0.05*	0.04**
	(8.00)	(0.04)	(0.03)	(0.03)	(0.03)	(0.02)
$E(Y_{peer}) - E(Y_{control})$	-8.12	0.01	0.01	-0.06**	-0.02	0.01
	(6.81)	(0.04)	(0.03)	(0.03)	(0.03)	(0.02)
$E(Y^{private}) - E(Y^{health\ system})$	-16.02***	0.09***	0.02*	-0.09***	-0.09***	0.08***
	(3.51)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)
$E(Y_{Netherlands}) - E(Y_{Spain})$	23.90**	-0.15**	-0.01	-0.14***	-0.15***	-0.04
	(9.77)	(0.07)	(0.03)	(0.04)	(0.04)	(0.03)
Constant	102.48***	0.57***	0.85***	0.52***	0.51***	0.91***

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**Time spent in solving the case**	**P(get high bonus)**	**P(get low bonus)**	**P(Correct diagnosis)**	**P(Correct prescription)**	**P(prescribe generic drugs)**
	(31.38)	(0.20)	(0.11)	(0.10)	(0.11)	(0.09)
COVARIATES						
Demographics	NO	YES	NO	NO	NO	YES
Preferences	NO	NO	YES	NO	NO	YES
Prescription behaviour	NO	NO	NO	YES	NO	YES
Entrepreneurship preferences	NO	NO	NO	NO	YES	YES
Order effect	NO	YES	YES	YES	YES	YES
Observations	1,812	1,812	1,812	1,812	1,812	1,812
Number of id	302	302	302	302	302	302
Individual random effects	YES	YES	YES	YES	YES	YES
Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. The complete regression could be found in the annex.						

Regarding the **differences between the two countries**, these can be observed in several outcome variables. First, Dutch doctors spent, on average, 24 seconds more than Spanish doctors in solving the case. This result can explain also why Dutch doctors have, on average, 15% less probability of getting a high bonus than Spanish colleagues, who seemed to be more efficient and productive. Interestingly, Dutch doctors also show a lower result in terms of 'quality of care', with lower probability of getting a correct diagnosis (-14%) and of getting a correct prescription (-15%) with respect to Spanish doctors.

Considering the results of the experiment, and before presenting the main findings of the study, it should be mentioned that there are differences between the results obtained from the two samples (when analysed per country), with most of the significant results being extracted from the Spanish sample.

There are several factors which could explain these results including cultural differences, differences in the healthcare scheme adopted at the national level, differences in attitude towards competition, and several others. Looking at the descriptive statistics of the two samples, the main difference at the behavioural level could be found when looking at the degree of reciprocity and the degree of altruism, between the two groups of participants, which are both slightly higher for Spain. However, such differences alone do not seem to be enough to explain the divergent results obtained when looking at the two samples. For this

reason, it seems that the most important differences could be the socio-demographic variables: the Dutch sample is indeed made up of younger, less experienced doctors with a higher proportion of female and non-married participants compared to the Spanish one. Therefore, it could be the case that differences in the results between the two samples could be attributed to the different composition of the two groups which could have affected their behaviour. For instance, given that the two *between* treatments envisage different competition settings, it could be the case that younger people are more prone to competition regardless of the setting and therefore the treatment has no effect on them and no significant difference is identified between the treated and the control group.

4.4 Discussion of the full experiment results

This section presents the main findings from the study, considering both the behavioural experiments (in Spain and in the Netherlands), the literature review and the interviews conducted with doctors and pharmacists.

The experiment, in particular, aimed at testing whether and to what extent the institutional setting can affect the behaviour of doctors, by investigating two areas: 'productivity' and 'quality of service'. In doing so, the experiment tested the potential effects produced by the presence of market competition (patients had the option to look for a second diagnosis at an extra cost) and peer competition (doctors were informed about their respective performance). The experiment also tested the difference in outcomes in two *within-subject* conditions, namely the healthcare payment scheme (where patients did not have to pay for the medicines themselves but these would be covered by the 'health insurance'), and the private payment scheme (in which patients had to pay for their own medicines).

The results are therefore presented both following the two main areas investigated under the experiment (productivity and quality of the service), and considering the different schemes under which they were assessed.

Looking at the **productivity** of doctors, and in particular to their *time spent in solving the medical cases*, the experiment shows that neither market competition nor peer competition conditions are significant factors in modifying the efficiency of doctors (§ finding 1) when the payment scheme is not taken into account. Interviews suggest, at the same time, that efficiency of doctors may be linked to other factors than competition, such as the possibility to delegate some routine tasks[48] or working closely with colleagues (as to create a sort of "pattern" and "common behaviour").

However, market competition becomes a significant factor – in the Spanish experiment – when considered under a specific health payment scheme: in particular, market competition seems to increase the time spent by doctors in solving the medical case under the public healthcare system (§ finding 2), compared to the control condition. This suggests a potentially significant (positive) effect of market competition on the efforts of physicians: in a context where patients have the possibility to receive a second opinion, doctors seem willing to spend more time on their cases, rather than focusing on maximising productivity (in terms of the number of cases analysed per unit of time).

The payment scheme overall plays an important role when it comes to efficiency: in particular, being under private payment scheme reduces the time spent in solving the cases with respect to health system payment (§ finding 3) in both samples.

When considering *financial incentives* (i.e. bonuses), results from the experiment do not provide definitive conclusions, as in most cases they are not statistically significant.

Regarding the likelihood to receive a bonus for the service provided, market competition condition seems to have a negative impact on it (in the case of Spain), in both payment

[48] As was reported – even to a lower extent – by pharmacists during the interview phase of the study.

schemes (§ finding 4). This goes in line with the result that giving patients the possibility to receive a second opinion increases the time doctors spend in reviewing each case. Considering the effects of the different schemes, being under the private payment scheme increases the probability of getting a high bonus (both in Spain and in the Netherlands) compared to the public health payment scheme.

Concerning the likelihood of receiving any bonus, results are significant only when considering a particular payment scheme (and not in both countries): in Spain, market competition has a negative effect on the likelihood when considered under the private payment scheme compared to the public health system scheme.[49]

Considering the **quality of services,** experimental conditions do not seem to have a statistically significant impact in all cases. Concerning the *likelihood to get the correct diagnosis*, both samples (ES and NL) show that more than 40% of the diagnoses were not correct, on average.[50] Market and peer competition did not have a (statistically) significant effect on the capacity to formulate a correct diagnosis in any situation. However, when considering each payment scheme, peer competition seems to have (mild) negative effects on the likelihood to formulate a correct diagnosis in the Dutch case, under the private payment scheme (§ finding 5) compared to the control condition. A possible interpretation of this result could be that under competition, physicians face an extra cognitive load at the moment of solving the cases, which could be driven by factors such as concerns over reputation or position.

Considering the *likelihood to get the correct prescription* and the *likelihood to prescribe generic drugs,* the experimental conditions hardly show any significant differences. However, market competition again seems to show positive effects (i.e. increasing the likelihood). In the former case, the likelihood is increased by market competition (in the Spanish sample) with respect to the control situation. In the latter case, the market competition has a similar positive effect (on both samples), suggesting that the introduction of market competition may have benefits in terms of an increased prescription of generic drugs (§ finding 6).

The positive input of market competition on quality can be seen in line with what some literature (Frakt 2015) and interviews have suggested: when competition between doctors is on the quality of services, it can be recognised as a positive tool to achieve better care for patients.

Changing perspective and analysing the experiment by looking at the situation (i.e. payment scheme) in which conditions apply, it is possible to observe that results – both in terms of efficiency and quality of services – are generally more positive under the **healthcare system payment scheme** compared to the **private payment scheme** (§ finding 7). In particular, being under the private payment scheme compared to being under the health system scheme has a negative effect, especially in terms of quality of care, while a rather positive impact on efficiency (with respect to the health payment scheme). For instance, being under the private payment scheme:

- Reduces the time spent in solving the cases, therefore increasing productivity of doctors;
- Increases the likelihood of getting the high bonus;
- Reduces the likelihood to get the correct diagnosis;
- Reduces the likelihood of getting the correct prescription (in the Dutch sample).

When considering the **different conditions** (namely, peer or market competition) under the different schemes, divergent results emerge from the experiment, making it more difficult to

[49] Being under health system payment scheme increases the probability of getting at least one bonus in 5% with respect to private payment scheme in the market competition condition

[50] The average likelihood was 0.58 in the Spanish sessions of the experiment and 0.39 in the Dutch sample

have a straightforward interpretation because the outcomes are somewhat inconclusive. All in all, it seems that facing a particular condition under the private payment scheme often brings poorer results than being under the health system payment scheme (as mentioned above).

In particular:

- The time spent in solving the case is 20 seconds lower under the private payment scheme than under the health system scheme (in the full sample);
- The likelihood of getting a high bonus is 12% higher under the private payment scheme compared to heath payment scheme in the Spanish sample, and 6% in the Dutch sample;
- The likelihood of getting a bonus facing market competition is higher when under the health system compared to being under the private payment scheme (in the Spanish sample);
- The likelihood of getting a correct diagnosis is:
    - Reduced by facing peer competition under the health system payment scheme (in the Spanish sample) compared to the control situation;
    - Lower when facing peer competition under the private payment scheme compared to being under the health system scheme;
    - Lower when being in the private payment scheme compared to the control situation (in the Dutch sample);
    - Increased when facing a market competition condition in the private payment scheme compared to being in the health system scheme (in the Spanish sample);
- The likelihood of getting a correct prescription is lower when facing peer competition under the private payment scheme than under the health system scheme (in the Spanish sample).

As discussed above, there are examples from the literature suggesting that correctly managed competition can have positive effects: Frakt (2015), for instance, notes that competition between hospitals may be an important and significant driver of quality and can help improve patient outcomes (for example by decreasing length of stay and mortality rates), and Gaynor, Morena-Serra and Propper (2013) found a positive correlation between competition on saved lives without raising costs and reducing the length of stays. At the same time, interviews with doctors indicated that, in their view, competition that is not adequately channelled could also have a negative effect on the profession (for instance by leading to a "price war" that would result in cutting costs of treatment and reducing the quality of care). Practitioners also mentioned possible indirect effects such as the fact that doctors could face additional burden in order to reduce costs and/or to increase revenues. Both are "business-related" activities which fall outside the typical tasks of a physician and could thus make becoming a doctor less attractive.

The findings of the experiment seem to suggest that **competition** can indeed have an effect on the productivity and the behaviour of doctors, where the health payment scheme is a pivotal part of the equation (§ finding 8). Findings on this aspect are not entirely conclusive, but they do show how competition can indeed produce positive results in terms of medical professionals' effort and quality of care in certain cases. Moreover, the experiment indicates that competition may have positive effects when it comes to patients: market competition seems to increase the likelihood of following the doctor's prescription, meaning a strong positive effect on patient trust (§ finding 8).

While the experiment has not produced significant results in this respect, the study has underscored that **peer review** and dialogue are widely recognised as important elements to

improve the quality of the service for patients (§ finding 9). In earlier literature, for instance, the laboratory and field experiment conducted by Brock et al (2016) observed that the average clinician provides about 3% better services when observed by a peer; it also found that generous clinicians react to peer scrutiny in the same way as non-generous clinicians. According to the study, many clinicians are intrinsically motivated to provide higher quality care; however, most clinicians respond to increased prosocial incentives in the form of scrutiny from peers. Further on this point, doctors and pharmacists reported in the interviews that working in a team, exchanging ideas and talking to peers makes it easier to enhance the standardisation of behaviours, adopting uniform protocols and shared best practices.

When it comes to drug prescription, the experiment has shown that, in both samples, the majority of doctors did not consider **generic drugs** to be a worse treatment than branded ones (§ finding 10).[51] The choice of generic drugs can indeed have positive effects on patients, in terms of costs saved and potential for wider availability compared to branded drugs. The choice of prescribing generic drugs – also as a cost-effective solution – was researched by Hassel et al. (2003) who found that general practitioners in Italy and the UK were keen to adopt a number of cost reduction strategies, probably because they were aware of the relatively high charges incurred by patients. Moreover, it appears[52] that the propensity to prescribe generic drugs is higher under the market and peer competition conditions compared to the control situation (in both samples).

In general, the analysis of evidence collected suggests other important findings.

First, health workers are overall strongly guided by their professional conscience, **professional ethos and pro-social behaviour** (§ finding 11). Interviews with both doctors and pharmacists confirmed that health professionals are generally moved by ethical elements and value their reputation as something they build during their education and training, and, for this reason, an intrinsic part of their profession. This is also supported by the results of Apathy and Yeager (2019) who underlined that motivation for healthcare workers to attend training activities was mostly related to personal growth. Therefore, personal and intrinsic motivation seem to play a stronger role than financial and economic incentives. This could be linked to the findings of Barigozzi and Burani (2016) who showed that health professionals working in non-profit hospitals (and therefore with a lower role played by financial incentives) are, in general, more intrinsically motivated to deliver quality services, because the hospital sacrifices some profits to follow its mission and becomes attractive for motivated workers.

Second, **professional regulation** may indeed play a role in ensuring quality of care, but it is unlikely to have an important effect when it comes to fostering actions in the public interest or cancel unethical behaviour (§ finding 12). The experiment has shown that doctors are fairly pro-social, and, in certain cases, the introduction of new framework elements does not significantly affect their behaviour, both in terms of efficiency and quality of services.

Moreover, individual doctors interviewed for this study agree that professional regulations (including licensing) have a limited effect in modifying behaviours. For instance, while licensing is indeed viewed as an important step of selection into the profession, what mattered more to the interviewees was the environment related to being part of the profession, i.e. education, ethical background or being part of a peer group. In addition, interviewed practitioners did not view additional regulation as effective in pursuing public interest goals. In their view, regulation becomes a useful tool to set a framework and define the limits of the profession, rather than micromanaging behaviour and choices. In addition, interviewees stated that too much regulation might result in unnecessary red tape that would be unlikely to constitute an

[51] For instance, 85% of doctors in the Spanish sample and 87% in the Dutch sample agree (either partially or completely) that generic drugs are used to treat the same diseases (as brand-specific drugs) to the same effects. 70% of doctors in the Spanish sample and 86% in the Dutch sample disagrees (either partially or completely) that treatments with generic drugs do necessarily require more time than brand-name drugs.

[52] As shown in the descriptive statistics in both the Spanish and Dutch case (see Table 9 and Table 30).

incentive for doctors to behave differently. The doctors' associations interviewed seemed to have a slightly different opinion on professional regulation and its effects than individual professionals: in their view, regulation is fundamental and is instrumental e.g. to prevent conflict of interests in the medical field.

5 CONCLUSIONS

Overall, on the basis of the experiment and the data collected, we can conclude that doctors are highly pro-social, with an inner attitude to pursue the public interest and follow the Oath of Hippocrates. Competition can indeed produce positive results in terms of effort and quality of care, but, in general, these effects are not straightforward, with mixed evidence stemming from the study.

The outcomes of the experiment indicate that relatively few factors significantly influence practitioner behaviour. Nonetheless, the literature review and interviews conducted show that there is mounting evidence supporting the prosocial behaviour of doctors – and health professionals in general.

These behaviours were clearly shown by doctors in recent times, and namely the current Covid-19 pandemic. Although this was not part of the current study, the recent pandemic showed quite clearly that doctors are indeed prone to behave and act in the social interest, putting their lives at risk working long hours in frontline hospitals without requiring any incentive or further push to their motivation.[53]

5.1 Competition can be a driver for quality and efficiency, but its effects are not always straightforward

Considering the results stemming from all sources, it is not entirely possible to conclude that competition has a straightforward positive (or negative) effect on the productivity of doctors and quality of services, and, if anything, the results from the experiment seem to provide mixed evidence when triangulating all elements of analysis. On the one hand, examples from the literature[54] suggested a positive relationship between the increased competition between hospitals and quality of care for patients, for instance by decreasing length of stay, shorter waiting times and better financial performances. Hospitals subject of analysis in the literature seemed also to have responded well to increased elasticity of demand, with improved quality of healthcare.[55]

Evidence of positive effects also stem from the experiment conducted in this study. Indeed, competition seems to have a positive effect in increasing the likelihood of getting a correct prescription in the Spanish sample and of prescribing generic drugs from doctors in both samples, regardless of the payment scheme. Furthermore, when considering that – under the healthcare system payment scheme – market competition actually increases the time spent by doctors on medical cases, this indicates that doctors spend more time in solving the medical cases rather than increasing their productivity, suggesting improved care for the patients.

Positive effects have also been spotted in the analysis of patient behaviour. In particular, market competition (with the possibility to have a second opinion) increased the likelihood that patients will follow the doctor's prescription in both samples, suggesting increased confidence from patients.

In addition, having a closer and more nuanced look at "competition", there are indeed elements that doctors report as being instrumental to increase their professional performance. Interviewed doctors mentioned that when market competition focuses on quality of care – rather than price – it can indeed foster a positive search for higher standards of treatment, incentivising hospitals and doctors to strive to be recognised as high-quality service providers. Furthermore, when peer competition and pressure are transformed into peer dialogue, review

[53] See for instance Caldas MP, Ostermeier K, and Cooper D. (2021) *When helping hurts: COVID-19 critical incident involvement and resource depletion in health care workers*. Journal of Applied Psychology. 2021 Jan;106(1):29-47.

[54] Frakt (2015), Gaynor, Morena-Serra and Propper (2013).

[55] Gaynor, Propper and Seiler (2016).

and cooperation, interviewed doctors had a rather positive opinion: working in a team, comparing choices and receiving advice from colleagues are all elements that allow doctors and pharmacists to improve the quality of their work, not to mention the possibility (especially in case of particular groups, such as for instance surgeons) to adopt shared protocols and best practices. Working alongside peers also contributes to creating a sense of "upholding a collective reputation", shared by the whole group.

On the other hand, other sources also point to potential negative effects of competition, especially when focused on price: interviewed doctors thought that in some cases increased competition might adversely affect their profession, leading in their view to an excessive focus on "price" rather than on quality. This may be true when considering the purely "economic" effect of competition, but it should be considered that behavioural effects can also be present. Increased competition could require practitioners to perform additional activities in order to reduce costs and to increase revenues, and such tasks typically fall outside the usual remit of a physician. In this way becoming a doctor would entail having to assimilate additional "marketing" skills and could thus become less attractive for people which want to focus their efforts on healing patients.

Mixed results are also apparent when considering the effects of competition together with the different payment schemes (this is further discussed below). As presented in chapter 4, peer competition proved to have a negative effects on the likelihood to get a correct diagnosis and a correct prescription in the Dutch sample when under the private payment scheme. On the contrary, market competition in the Spanish sample had a positive effect in increasing the probability of getting a correct prescription under the health system payment scheme.

To sum up, the experiment suggests a positive impact of competition on doctors' effort, the likelihood of prescribing generic medicines and patients' trust, under certain conditions. As suggested by the literature and interviews, it may also be the case that market competition between healthcare facilities has stronger positive effects (perhaps due to the fact that at hospital level this could lead to a more efficient management of resources, reducing waste and inefficiencies).

5.2 Effects on behaviour may be influenced by the relevant healthcare payment scheme in place

The experimental design has tested the effects of different healthcare schemes on productivity and quality of services of healthcare professionals. In particular, the experiment included two within-subject conditions: one in which the health insurance system pays for medicine and another in which patient pays for medicine.

Here too, the evidence emerging from the study is not straightforward and conclusive and does not point to a single conclusion, since in most cases differences between the two schemes are not significant or they affect only some elements of physicians' productivity and quality of services, and not in both samples.

When considering the difference between the two schemes under the control condition, there is in general a mixed effect of the private payment scheme on almost all the dependent variables considered in both samples.

Interestingly, considering the results of the experiment, being under the private payment scheme seems to solely increase the productivity of doctors, reducing the time spent on solving the cases and increasing the likelihood to receive bonuses. Moreover, being under the private payment scheme seems to have negative effects on quality of care, including the

likelihood for doctors to get the correct diagnosis and correct prescription with respect to the health payment system.[56]

It should be underlined that, in general, the different payment schemes seem to play a role in the productivity and quality of care of doctors and also produce larger effects compared to the introduction of peer and/or market competition (vis-à-vis the control situation).

Therefore, it appears that the private payment scheme (i.e. when the patient pays for the treatment) drove doctors to be more efficient, but to pay less attention to the quality of treatment.

5.3 Professional regulation is important for all professionals but for different reasons and with different effects

The cross-cutting analysis of findings provides indication that while professional regulation plays a role in influencing practitioner behaviour, such a role is neither linear nor straightforward.

One example is given by the licence needed to practice the profession. As shown in the study, both doctors and pharmacists generally agree that it is important to ensure that everyone in the profession has a licence, to keep some sort of selection and enforce standards. However, especially for doctors, the element that plays a role in shaping their behaviour is the overall process leading to the licence – and the need to keep it – together with the profession itself.[57] However, different interviewees mentioned that licensing is an important "unifier" to medical professionals. In their view, the role of licensing is important in creating group identity.

Similarly, over-restrictive licensing was not highlighted as a limiting factor for the profession. While shortages of medical personnel are a diffuse problem in the EU – underlined even more by the Covid-19 pandemic – according to the interviewees, they are not significantly linked to existing regulation.

Based on the evidence collected, it could be inferred that, in general, licensing has different effects on the different professions (doctors and pharmacists) considered in this study. Based on the outcome of interviews, for pharmacists, the added value lies in the possibility of being recognised as reliable health professionals and making them responsible for the advice provided to clients and patients. At the opposite end, the doctors considered the license as a sort of "reward" and concrete evidence of their efforts in completing the required educational path. Also for this reason, the risk of losing it represents a strong additional incentive to behave according to professional ethos.

. The presence of licensing has positive effects according to doctors and pharmacists, as it establishes a clear framework that defines guidelines and codifies major elements and standards related to the profession (e.g. on conflicts of interest).

At the same time, as discussed above, competition in terms of the possibility for a patient to choose between alternative healthcare providers can have a positive influence on effort and motivation of healthcare professionals. Another interesting point emerges from the study, and in particular from the feedback provided by the professionals interviewed. Both doctors and pharmacists agreed in underlining two elements:

- Being part of a group shapes behaviours and choices. Being part of a group or a joint practice brings professional to talk to each other, exchange experiences and seek second opinions. This helps not only to reduce possible mistakes, but also to increase

[56] In the Dutch sample.

[57] According to a number of interviewed doctors, the main aspect which makes licensing so important is the "punitive" element since the risk to lose the license represents a very strong incentive to good behavior in their view.

the homogeneity and uniformity of behaviours in a group, as well as the dissemination of best practices.

- The importance of collective reputation. While reputation seems very important especially for pharmacists, both professions underlined how being part of a group implies that the actions of each individual affects the reputation of everyone in the group, and this in professions where competition exists. Being part of a group, therefore, provides a sort of extra-motivation to live up to certain standards, establishing uniform and common protocols to be followed, with a daily obligation to compel and behave within certain limits.

In this sense, peer pressure could be seen as a possible substitute or reinforcement of regulation when it comes to fostering ethical and professional behaviours in a group.

5.4 Doctors are a socially-minded profession, and while interests and incentives exist, the basic motivation is given by the profession itself

Looking at the evidence collected within this study, results corroborate the hypothesis of an intrinsic pro-social behaviour amongst healthcare professionals. Interviews clearly showed that doctors and pharmacists find intrinsic motivation in acting for the public interest without the need for particular incentives or regulations prescribing them to do so. Various physicians have reported that the reason why many people choose this profession is that some values such as altruism and generosity are very important to them. Moreover, several interviewees underscored the importance of teaching such values starting from school, rather than having them "forced upon" by top-down regulation.

For instance, looking at the particular case of drug prescription, the experiment has shown that, in both samples, the majority of doctors prescribed generic drugs when given the choice between brand and generic alternatives, attempting to act in the best interest of their patients. Indeed, the fact that physicians were keen to prescribe generic drugs could be interpreted as a prosocial behaviour since, being aware of the relatively high charges incurred by patients or by the healthcare system as a whole, they chose the less expensive option; it should be noted that this effect is remarkably stronger in the country with the comparatively lower income per capita, namely Spain.

In addition, it should be mentioned that, overall, the results – both in terms of productivity and quality of services – are generally more positive under the health system payment scheme compared to the private payment scheme. This can be seen as partially aligned with Barigozzi and Burani (2016) who showed that professionals working in non-profit hospitals tend to be more motivated since they are aware that the facility is committed not to make profit but to follow its mission of helping the patients, making it more attractive for motivated workers.

The recent Covid-19 pandemic, in addition, has clearly demonstrated the intrinsic pro-sociality of healthcare professionals, who have exerted a huge effort to fight the global epidemic, in spite of the risks associated to the possibility of being infected by the virus. This has been further confirmed in a number of recent academic studies which have analysed the behaviour of doctors and healthcare professionals in general during the current emergency situation. In particular a study from 2021[58] has concluded that *"wanting to help can hurt"* since in the study the higher prosocial motivation relating to the contingent situation exacerbated the positive relationship between intensity of involvement in the pandemic response and emotional exhaustion. Further to this, another study published in 2020[59] found that the participants in a survey conducted for the study reported to be significantly more worried about others than

[58] Caldas, M. P., Ostermeier, K., & Cooper, D. (2021). When helping hurts: COVID-19 critical incident involvement and resource depletion in health care workers. Journal of Applied Psychology, 106(1), 29–47.

[59] Barzilay, R., Moore, T.M., Greenberg, D.M. et al. Resilience, COVID-19-related stress, anxiety and depression during the pandemic in a large population enriched for healthcare providers. Transl Psychiatry 10, 291 (2020)

about getting COVID-19 themselves, and they claimed this finding could be attributed to increased prosocial behaviour under stress.

Finally, besides being socially-driven, doctors (and, to a lesser extent, pharmacists) have shown how they are ready to delegate part of their tasks to focus even more on their core activities. Interviews highlighted how doctors are generally in favour of the possibility to delegate routine tasks to "physician assistants" under the doctors' supervision.

Disclaimer

The research presented in this document is of a novel and exploratory nature and the findings should not be interpreted as intentions to or recommendations for making changes to the regulatory framework.

6 POLICY IMPLICATIONS AND RECOMMENDATIONS

The findings of the study highlight how, on the one hand, physicians clearly tend to behave and act in the social interest regardless of regulation and incentive structure. On the other hand, the results of the experiment are at times not sufficiently conclusive to make more general assumptions regarding the impacts of institutional environment on the behaviour of medical professionals. All in all, based on the findings and conclusions of the study, the following areas of recommendations are provided.

It is important to point out that the research presented in this document is of a novel and exploratory nature and the findings should not be interpreted as intentions to or recommendations for making changes to the regulatory framework.

Carefully consider and balance the impacts of market and peer competition

As described in the previous sections, there is no straightforward causal link between (market and peer) competition and practitioner behaviour and choices.

While examples of positive effects were found in the literature, interviews underscored the risks of excessively aggressive competition (when based solely on price), and the experiment produced mixed results on this matter. Specifically, the experiment showed that market competition can indeed produce positive effects, especially on effort, quality and patient trust, but these results were not always common to both samples and came at a cost of a negative effect on doctors' productivity.

Accordingly, while it is not possible to provide a straightforward and unique recommendation, results from this study suggest that the introduction of (market and/or peer competition) should be decided carefully, as their effects may not be uniform, especially when considering the specific payment scheme. Therefore, it becomes crucial to understand the context in which such competition would take place. Moreover, one point to be stressed relates to the importance to seek and encourage peer conversation and cooperation (rather than peer competition and pressure). This has emerged quite clearly from the study - from the interviewed doctors as well as pharmacists, suggesting that this element could lead to positive results for both professionals and patients, potentially leading to the adoption of uniform and shared best practices, protocols, decisions and behaviours so as to uphold to the "collective reputation" of the group.

Tailor policies to the different healthcare schemes adopted

Another element that has emerged from the experiment is that being under a specific payment scheme (health system vs private payment) can lead to significantly different results. While the experiment does not produce definitive conclusions, evidence suggests that facing competition (market or peer) tends to improve outcomes more significantly in the health system payment scheme.

This means that any public policy intervention (both regulatory and not) should take into account the environment in which it is applied. Introducing additional competition, for instance, while not a necessarily positive or negative element per se (as explained above) may produce different results in one situation compared to another.

Therefore, a one-size-fits-for-all approach is likely not be not effective; rather, different schemes might react to different types of regulatory approaches.

Consider when regulation is actually needed

The study highlights that increasing regulation does not necessarily bring additional benefits to doctors and patients. On the one side, the introduction of new regulatory conditions does not seem to have a real effect on changing physician behaviour. On the other hand, interviewed practitioners clearly indicated that too much regulation (or regulation introduced just for the sake of more regulation) may be counterproductive for both efficiency and quality of the service.

Therefore, the impacts of any decision to introduce or change regulatory elements for the profession should be carefully taken into account, so as to determine when they are actually needed.

Finally, as already mentioned, additional elements may help influence practitioner behaviour other than regulation, such as peer and market competition. When correctly deployed, these can help steer behaviour towards desirable public policy outcomes.

ANNEX 1: SUMMARY OF THE SELECTED STUDIES

In total, out of the 71 articles included, most studies conducted an experimental set-up in their study design; however, a large variety of qualitative studies were also conducted (see Table 51). In some studies, the study design was not explained thoroughly; rather, a relatively simple quantitative or qualitative description of the results was provided.

Table 51 - Study designs

Study design	Number of articles (N= 71)
Experiments	17
Discussion	13
Cross sectional	7
Mixed-methods	7
Quantitative analysis	7
Interviews	6
Reviews	6
Qualitative analysis	4
Content analysis	2
Policy analysis	1
Case study	1

Source: Authors' elaboration

In addition, most studies were developed around a limited number of countries, and some in multiple countries. This is linked to the fact that most studies were conducted in English-speaking countries. Out of the total, 11 studies were not related to a country (such as systematic reviews or general discussion articles).

Table 52 - Country of study

Country of study	Number of articles[60]
United Kingdom	15
Australia	8
Germany	8
United States	7
Netherlands	6
Denmark	2
Iran	2
Norway	2
Canada	1
New Zealand	1
Switzerland	1

[60] This column does not add up to 71, because some studies were conducted in more than one country

Country of study	Number of articles[60]
Sweden	1
Congo	1
Cambodia	1
Malawi	1
Benin	1
Kenya	1
Zimbabwe	1
Ethiopia	1
Italy	1
India	1
Bangladesh	1
South-Africa	1
Nepal	1
Sierra Leone	1
Tanzania	1

Source: Authors' elaboration

Furthermore, most studies have been conducted during the last 10-15 years, in particular the last 5 years, as can be seen in Table 53. These results show that there is an increasing attention for factors that affect healthcare provision in the last few years, in particular in a group of Western, Scandinavian and Developing countries.

Table 53 - Year of publication

Year of Publication	Number of articles (N= 71)
2015-2019 (March)	42
2010-2014	16
2005-2009	10
Until 2005	3

Source: Authors' elaboration

Finally, certain general topics of the selected studies were coded based on their main focus. Most studies were conducted to examine the effects of financial incentives, while organisational and non-financial incentives were included in a fewer number of studies. Furthermore, some studies discussed or analysed motivation for health professionals explicitly. When discussing the results from the systematic review (Annex 3), we will follow this order as well.

ANNEX 2: FULL DESCRIPTION OF RESULTS OF LITERATURE REVIEW

Financial incentives

First, because most studies investigated the effect of financial incentives, we will discuss these results from this starting point. Self-interest and responding to financial incentives are an unavoidable and potential beneficial aspect of human behaviour if these tendencies are directed into prosocial behaviour, thereby improving the performance of the national health service (Maynard, 2007). Kesternich et al. (2014) for example showed in an experimental study that professional norms derived from the Hippocratic tradition shift weight to the patient in the physician's decisions, while decreasing self-interest and efficiency concerns, which is in the end beneficial for society.

Studies cited above found that the Hippocratic Oath, which is still the predominant behavioural norm in the medical profession, puts all emphasis on the individual patient, thereby not sufficiently taking into account the societal costs that are caused by individual decision making by doctors. This ultimately also affects the health service provision at the individual level. As Sulmasy (1999) argues, "Shopkeepers do not swear oaths about shop-keeping. Neither do investors swear oaths about investment. But in most places in the world, doctors swear about doctoring".

Categories of financial incentives

Lohman et al. (2017) showed that there are six categories of motivational mechanisms that explain the effect of performance-based payments; these should be examined more thoroughly by scholars to determine the exact effectiveness of performance-based payments. In their view, financial incentives improve performance by:

(1) Acting as a periodic wake-up call to deficiencies in their day-to-day practice;
(2) Providing direction and goals to work towards more efficiency;
(3) Strengthening the perceived ability to perform successfully at work and triggering a sense of accomplishment;
(4) Instilling feelings of recognition;
(5) Altering social dynamics, improving teamwork towards a common goal, while also introducing social pressure; and
(6) Offering a 'nice to have' opportunity to earn extra income.

Lohman et al. (2017) strongly recommended taking into account all motivational mechanisms more explicitly in the future when designing performance-based payments. This would make it possible to fully exploit the approach's potential for enhancing the performance of healthcare professionals by fostering prosocial activities within their professional work.

In addition, accountable care using global payment with performance bonuses has shown to be a promising tool in controlling spending growth and improving the efficacy of healthcare provision (Barry et al. 2015). Considering the increasing influence of neoliberal market thinking in the healthcare sector, there is growing interest in performance-based financing, also known as pay-for-performance (P4P), in particular in low- and middle-income countries which need to improve their healthcare systems significantly in order to be able to provide their citizens with high-quality healthcare (Bertone et al. 2016).

Studies examining this method in developing countries show that the general perception is relatively positive (Bertone et al. 2016; Singh et al., 2015), although most participants

included in the studies are still in favour of salary increases over pay-outs triggered by performance-based financing.

Financial incentives increase healthcare costs and reduce intrinsic motivation

In contrast, other findings are less positive. For example, Brekke et al. (2015) showed that general practitioners increase the number of visits, while the treatment intensity (e.g., prolonged consultations, lab tests, medical procedures) decline after they have obtained specialist certification and thus can charge a higher consultation fee.

Some experiments have also been conducted to establish the effects of financial incentives on quality of care. Hennig-Smidt et al. (2009) showed that patients were over-served in a system where fee-for-service is implemented, compared to a capitation payment system. In the fee-for-service system, physicians receive payment separately for each unit of medical service rendered, while in the capitation system physicians receive a lump-sum payment for the treatment of a patient, irrespective of the quantity of services rendered. Huck et al. (2016) and Keser et al. (2014) showed that patients consult more often, and physicians over treat more often, in a system where insurance will pay for treatment, compared to the baseline condition where individuals pay for treatment.

On the opposite end of the spectrum, patients in a system of capitation may be underserved by health services (Keser et al. 2014). On the other hand, if there is a combination of the two, i.e. a system of competition and capitation, competition is found to partially offset the adverse effects of insurance, meaning that most patients seek treatment, but overtreatment is moderated by the decisions of health professionals. Lagarde et al. (2017) showed that salary yields the lowers quantity of output of health-service provision, while fee-for-services leads to the highest. The highest quality of health service provision is achieved when participants are paid by salary, followed by capitation. Importantly, the authors found significant heterogeneity in behaviour, but showed that intrinsically motivated individuals were hardly sensitive to financial incentives.

Fox et al. (2013) showed that, drawing on both qualitative and quantitative data at different levels of the health system in Congo, there was no evidence of benefits in terms of any of the service inputs, processes or outputs measured. In Cambodia, financial incentives affected the job motivation of health practitioners (Khim, 2016). In addition, by comparing the healthcare systems in the United Kingdom with Italy, Hassel et al. (2003) found that general practitioners in Italy were able to choose reimbursable products for patients, so they felt less urgency compared to UK doctors to look for alternative means to reduce costs. Conversely, general practitioners in the UK have developed a large number of cost reduction strategies, probably because of the charge system itself and the relatively high charges incurred by patients.

Green (2014) conducted an experimental study and showed that physicians were intrinsically motivated to provide high quality, and that relying exclusively on extrinsic incentives to motivate physicians is detrimental to the quality of care and costly for the healthcare industry because it will have counterproductive effects on their motivation. In addition, Gillam et al. (2012) have shown in a systematic review that the effects of pay-for-performance in improving quality of care for chronic diseases were modest, and the impact on costs, professional behaviour, and patient experience remains uncertain.

Further research is needed to establish how to improve quality across different domains, while minimising costs and overcoming any unintended adverse effects of payment for performance schemes. Gillam et al. (2012) therefore argue that healthcare organisations should remain cautious concerning the benefits of pay-for-performance schemes. In

addition, Kane et al. (2019) demonstrated that analysing existing institutional, management, and governance arrangements and capabilities is also important, in particular when designing and implementing performance-based financing interventions. Performance-based financing cannot, on its own, overcome chronic system weaknesses; these can only be overcome by putting in place organisational change management processes, targeting both the system and organisational culture. This is also shown by Werner et al. (2011), who investigated the issue in an extensive research comparing 260 hospitals with a pay-for-performance system with 780 control hospitals. The results showed that the performance of the hospitals in the project initially improved more than the performance of the control group. More than half of the pay-for-performance hospitals achieved high performance scores, compared to fewer than a third of the control hospitals. Importantly, after five years, the two groups' scores were virtually identical. Improvements were largest among hospitals that were eligible for larger bonuses, were well financed, or operated in less competitive markets.

These results show that tailoring pay-for-performance programmes to hospitals' specific situations could have the greatest effect on health care quality. Hafner et al. (2017) have shown that physicians take into account the payoffs of third parties as well, in this case health insurance brokers, in their provision of medical services. Participants in the medically-framed experimental condition behaved in a slightly more patient-oriented fashion when compared to a more neutral framing, thereby underscoring the significant impact on practitioner behaviour in systems where healthcare is paid by health insurance.

Biegler (2015) showed that priming (such as direct to consumer advertising of prescription pharmaceuticals) induced preferences and potentially the actual consumption of the advertised drug, thereby reducing the autonomy of practitioner decisions. Because this priming effect operates subconsciously, it is difficult to override its effect and make fully rational choices in the selection of the most appropriate medicine. In addition, Brosig-Kochman et al. (2015) showed in an experimental study in the laboratory that mixed payment systems reveal significant overprovision of medical services under fee-for service, and significant under provision under capitation, though less than predicted when assuming profit-maximisation.

The abovementioned studies showed that introducing mixed payment systems significantly reduced deviations from patient-optimal treatment. These responses can be explained by a behavioural model capturing physician altruism. Brosig-Koch et al. (2015b) confirmed this in another experimental study, using artefactual field and lab experiments to investigate how fee-for-service and capitation affect medical service provision. Significantly more medical services were provided under fee-for-service compared to capitation. Introducing transparency, for instance by making medical students' treatment decisions known to their peers, has a positive impact on patients' health benefits (Godager, Hennig-Schmidt, & Iversen, 2013).

Conclusion

Altogether, the collected evidence shows that financial incentives work predominantly in developing countries where salaries are relatively low, as well as in limited number of Western countries. However, the evidence also points to the fact that intrinsic motivation of health professionals to behave pro-socially should be taken into account when designing healthcare policy, as financial incentives can have adverse effects on the intrinsic motivation to make the best choices for patient.

In addition, the interpretation of the pay-for-performance schemes by health professionals are essential, so communication on why financial incentives are included in the health provision is of great importance. Policymakers and healthcare providers

should remain extremely cautious vis-à-vis the benefits of pay-for-performance schemes before introducing such mechanisms.

Due to the asymmetric information inherent in medical markets, where health professionals have significantly more information than (for example) patients, changes in the information structure are likely to cause substantial variations to the environment in which healthcare providers operate. Therefore, performance disclosure could influence health professionals' medical decisions.

Competition and organisational regulations

Next to the financial incentives, organisational regulations and healthcare provision are also investigated in a great number of studies. For example, Plomp (2008) discusses the influence of a more competitive market in the Dutch occupational health services that in turn affected health service provision. As a consequence of more competition, private insurance companies gained influence, and only after the development of a more effective social infrastructure intended effects (lower absenteeism and disability) were achieved. Occupational health professionals were initially opposed; however, by redefining their professional domain and identity, the health professionals succeeded in gaining negotiating power, in order to preserve and further develop their expertise and professional integrity.

Frakt (2015) argues that competition between hospitals is an important and significant driver of quality and can help improve patient outcomes; for example, it may decrease length of stay and mortality rates. In addition, where tested it stimulated better management, that subsequently is related to lower staff turnover, higher composite quality scores, lower lengths of stay, lower infection rates, shorter waiting times, and better financial performance.

In contrast, Barigozzi and Burani (2016) showed that health professionals working in non-profit hospitals are, generally speaking, more intrinsically motivated to deliver quality services, because the hospital sacrifices some profits to follow its mission and becomes attractive for motivated workers. Brekke and Sørgard (2007), and Moghri et al (2017) follow the same reasoning when it comes to dual practices, whereby physicians allocate their time and effort both in the public and private sector based on the public wage income and the private sector profits. The authors show that this results in lower overall health care provision, because it "crowds out" intrinsic motivation of health professionals to conduct their work. Therefore, the most effective intervention would be to ban dual practice, according the authors, although offering a higher wage could also be a possibility; however, the latter option would inevitably lead to increases in general healthcare costs.

Gaynor, Morena-Serra and Propper (2013) studied the effects of reforms by the UK government to promote competition between hospitals. Patients were given the choice of location for hospital care and provided information on the quality and timeliness of care. The authors found a positive correlation between competition on saved lives without raising costs and reducing the length of stays. Subsequently, Gaynor, Propper and Seiler (2016) found that the elasticity of demand faced by hospitals increased substantially post-reform and that hospitals responded to the enhanced incentives by improved quality of healthcare provision.

Control registers

Garpenby and Carlsson (1994) report on practice in Sweden concerning national quality control registers. These registers represent a potentially important primary data source for comparative studies and can play an important role in a national strategy for control

and improvement of health care quality. Their findings were based on (a) interviews with physician managers of the registers, (b) questionnaires to selected hospital departments participating in the registers and (c) questionnaires to elected officials and administrators representing the local health care providers. According to the participants, the registers and the information they contain illustrate the on-going conflict between openness and consumer sovereignty in health care on the one hand and professional autonomy on the other.

Health service accreditation programmes have been explored in Australia by the alteration of underlying programme philosophies, shifting of programme content focus and details, different surveying expectations and experiences, and the influence of external contextual factors upon accreditation programmes. Three accreditation programme models were noted by the participants in a study conducted by Greenfield et al. (2016) among Australian stakeholders, namely (1) regulatory compliance, (2) continuous quality improvement, and (3) a hybrid model integrating elements of the first two. The hybrid model was considered to be the most effective solution, whereby minimum standards were promoted and continuous quality improvement was stimulated, through examining the structure and processes of organisations and the outcomes of care.

This hybrid model appears to be directing organisation and professional attention towards enhancing their safety cultures. In addition, in Australia deployed a national registration and accreditation scheme that has created unprecedented opportunities to explore the distribution, practice patterns and behaviours of Australian health practitioners (Bismark et al., 2015). Comparisons of health service accreditation programmes in low- and middle-income countries with those in higher income countries showed that there are similar on promoting improvements, applying standards and providing feedback, but differ on the divergence over specialised features rather than the general logic (Braithwaite et al. 2013).

Dower et al. (2013) showed that because regulation and licensure of health professionals falls to the states in the US, such regulation may limit the effective and efficient use of the health workforce by creating mismatches between professional competence and legal scope-of-practice laws, potentially perpetuating a lack of uniformity. Dower et al. therefore propose to strengthen regulation in health professions, including aligning scopes of practice with professional competence for each profession in all states, assuring the regulatory flexibility needed to recognise emerging and overlapping roles for health professionals, increasing the input of consumers, basing decisions on the best available evidence, allowing demonstration/pilot programmes, and establishing a national clearinghouse for scope-of-practice information. Hausman and Le Grand (1999) discussed that external incentives involving the possibility of heavy central monitoring may affect the behaviour and motivation of health practitioners in potentially harmful ways.

In addition, Bruns et al (2018) have tested electronic health records that have been widely proposed as a mechanism for improving health care quality. The results supported the proposal that use of EHR systems can promote the use of client progress data and promote efficiency. However, there was little evidence of any impact (positive or negative) on overall service quality, fidelity, or client satisfaction. The field of children’s behavioural health services would benefit from additional research on EHR systems using designs that include larger sample sizes and longer follow-up periods.

Bugge et al (2006) showed that two-directional information exchange between the patient and the health professional concerning the symptoms the patient is experiencing, the results of any investigative or diagnostic test, and their respective ideas and concerns

about the nature of the problem, are important factors to be considered in order to overcome uninformed decision making.

Another methodology to overcome information asymmetry is to provide patients with the possibility to use a second opinion. Health insurers in several countries (e.g., United States and Germany) encourage their insurers to search for a second opinion when they are recommended an expensive treatment, in order to reduce mis-diagnoses and overtreatment (Wanda et al. 2016). Introducing the possibility that patients may reject the first treatment recommendation and receive a second opinion (at a positive cost) significantly reduces physicians' overtreatment. Compared to the situation in which patients have to accept the first treatment recommendation, second opinions reduce the actual overtreatment level by nearly 40 percentage points, only by the "deterrent" effect of second opinions. "Threatening" health professionals with second opinions in the market might be a valid instrument to incentivise physicians to overtreat less often and decrease the information asymmetry.

Cost-effectiveness analyses

In many countries a trend supporting cost-effectiveness evaluations is already established to decide on reimbursements and pricing of pharmaceuticals, such as Monitoring and Assessment Framework for the European Innovation Partnership on Active and Healthy Ageing (MAFEIP). Pitt et al. (2015) propose that to foster the efficient and effective use of the scarce health service resources it will be necessary, over time, to adopt system modelling solutions. An alternative to modelling solutions is to assess cost-effectiveness by establishing the quality of care and compare it to trainings costs (Tolsgaard et al., 2015). Technology appraisals are based on clinical and economic evidence and are based on the use of new and existing medicines and treatments, thereby creating a more objective analyses of effectiveness of interventions. Dietrich (2009) showed that the National Institute for Health and Clinical Excellence's negative and restricting technology appraisals did not reduce the number of prescription items dispenses and net ingredients costs in the ambulatory care of the National Health Service in England and Wales. Nonetheless, the author considers cost-effectiveness appraisals, as NICE or the German Institute for Quality and Efficiency in Health Care as useful and important tools to enhance the discussion about methods and acceptance of evidence-based medicines in general.

In order to establish how outcomes are affected by regulations and incentives, we first need to establish what factors are important to assess as an outcome of the intervention. Duncan et al. (2012) showed that many services fail to deliver routine outcome measurements in practice. They have showed that factors at individual, managerial and organisational levels are considered as facilitators and barriers to conduct routine outcome measurements. Professionals' level of knowledge and confidence about using the outcome measures, and the degree of organisational and peer-support professionals received with a view to promoting their work in practice were found as the most important factors that both drive and reduce to undertake routine outcome measurements.

Based on a discrete choice experiment, Koopmanschap et al. (2010) showed that severity of disease, costs per quality-adjusted life-year gained, individual health gain, and the budget impact were the most decisive decision criteria among policymakers, health technology assessment experts, and advanced health technology assessment students in healthcare priority setting. Health gains that include quality of life improvements were not crucial in decision making, although these are to be included in Dutch reimbursements dossiers for new drugs. Effective opportunities should be provided in order to be able to assess problems that arise in the motivation and efforts

of health practitioners to conduct their profession to the best they can. Next, Gorman et al. (2008) mention that a mixture of quantitative and qualitative measures is needed to have a more valid and reliable assessment of health service quality. For example, Gorman et al (2008) propose that quality of incident and error monitoring systems should be used by healthcare providers, with a view towards:

- Determining job fit;
- Consequent informed revisions of training programmes and employment models; and
- The assessment of drivers and outcomes of clinical decision making.

Finally, Hanbury et al. (2011) have shown that it is important for interventions to have a theoretical base, explore the local context, and to use mixed and multiple methods of evaluation to establish intervention effectiveness. Future research should seek to further develop the evidence-base for linking specific intervention strategies to specific behavioural barriers, explore the potential of theories that take into account broader social and organisational factors that affect health professionals' practice and focus on the process of data synthesis for identifying key factors to target with tailored interventions.

Communication with professionals or patients

Sometimes, multiple care processes affecting an individual patient are guided by implicit and possibly conflicting goals for care (Berntsen et al., 2016). A method to solve this issue is to use "Goal Hierarchies", that can be used to set personal goals above professional goals; these may clarify and resolve tensions between potentially conflicting goals. Harrisson et al. (2016) showed that an open and honest discussion between healthcare providers and the patients and families is considered to be a central feature of high quality and safer patient care. Semi-structured interviews with doctors and nurses were found to be critical in supporting open disclosure, for the following reasons:

(1) It should be considered as a moral and professional duty;
(2) Positive past experiences seem to be important;
(3) Perceptions of reduced litigation;
(4) Role models and guidance; and
(5) Clarity.

Greater openness in relation to adverse events requires health professionals to recognise candour as a professional and moral duty, exemplified in the behaviour of senior clinical practitioners and that seems more likely to occur in a non-punitive, learning environment. Recognising incident disclosure as part of ongoing respectful and open communication with patients throughout their care is critical. Ritter et al. (2018) showed that scientific findings across disciplines highlight consistent effects of legally required supervision on the delivery and cost of health services, while illuminating discipline-specific factors relevant to the understanding of a single profession and practice setting.

Another method is visitation among allied health professionals. Hofhuis et al (2006) showed that visitations by allied health professions, such as dieticians, exercise therapists, physiotherapists, dental hygienist, occupational therapists, podiatrists, and radiology assistants were considered as a very effective method to stimulate quality improvement. Participants intended to carry out two-thirds of the commendations, discussions led to an increased awareness of weak points and strong points, and actual improvements were also observed. In addition, Hopia et al (2014) showed that health

practitioners in their final stage of education were concerned about providing quality of care in challenging situations and that multiple ethical dilemmas arose in their work.

Furthermore, (online) discussions among healthcare providers provided them with an opportunity to relate ethical principles to real ethical dilemmas and problems in their work as well as to critically analyse ethical issues. These discussions could and should be held during the education and in the practice and are important for health policy makers to take into account. A different solution was proposed by Oades et al (2010), who state that most mental health outcomes and satisfaction measures have been developed by academic researchers or service provider, and consumers have only been engaged as participants or advisors in a very limited fashion. Therefore, they came up with a consumer satisfaction questionnaire in which consumers work as collaborative researchers to increase face validity and relevance of research, examining health service provision.

Overall, it is important to examine effective sources of notifications of concern regarding the health, performance and conduct of health practitioners. Bismark et al. (2019) showed that patients and their relatives could be an important contributor in this area, next to colleagues and self-reporting. Participants in their study reported 78% of notifications of their health professionals regarding clinical performance, including diagnosis, treatment, and communication. Furthermore, self-reports commonly related to health impairments, such as mental illness or substance use. Other agencies played a role in reporting concerns about prescribing or supply of medicines.

Another interesting aspect is to assess the understanding of pharmaceutical industry practitioners on conflicts of interest (Grundy et al., 2017). Industry employees reported that they clearly understood conflicts of interest within the context of their roles as employees of companies and described management of conflict interest as a routine and accepted process within their companies. However, their relationships with health professionals where not identified as posing a conflict of interest. Management of a conflict of interest was not left to the individual but was determined by leadership and enforced by the company hierarchy.

Conclusion

In general, multiple organisational regulations have been examined that affect healthcare provision. For example, instruments that stimulate competition between hospitals, or within hospitals were examined, providing inconclusive results. In addition, control registers are implemented in multiple countries, in order to increase control over the quality that health professionals deliver. The main disadvantage is that health professionals' intrinsic motivation is decreased as a consequence of these regulations. Another method to come up with a more objective measurement of effectiveness of healthcare provision are cost-effectiveness analyses, that are increasingly more popular because they are based on a more objective methodology to establish the effects of interventions and societal costs that are related to the intervention. Finally, communication with professionals or patients is assessed as having broadly positive results, both for the health professionals and the healthcare outcomes.

Other non-financial incentives

Although the general opinion is that financial incentives are an important instrument in motivating professionals to work harder and improve quality of their work, non-financial incentives are also considered as important factors, in particular by health professionals themselves. For example, Mathauer and Imhoff (2006) have shown, among health professionals in Benin and Kenya, that health workers consider non-financial incentives

and HRM tools are an important role with respect to increasing motivation of health professionals. The availability and usage of HRM tools can uphold and strengthen the professional ethos of doctors and nurses, by acknowledging their professionalism and addressing professional goals such as recognition, career development, and further qualifications that are important for health professionals. In addition, Aparicio et al. (2018) showed in their scoping review that expressions of gratitude by patients and their families also have an important personal and professional effect on health professionals that is long lasting, although a systematic study of its effect is needed.

Fotaki (2014) stated that trust has long been regarded as a vitally important aspect of the relationship between health service provides and patients. In contrast, consumer choice has been increasingly advocated as a means to improve the quality and effectiveness of health service provision, although it is uncertain how the increase of information allows users of health services to exercise choice and various dimensions of trust and how this influences patients and services. Moreover, Fotaki (2014) argues that the move from trust to choose is based on the economic premise of rational individuals, as homo-economicus, that, if given the necessary and relevant information, will make decisions that will maximise their welfare. This over-reliance on rational-calculative aspects of trust will be at the expense of embodied, relational and social attributes that are also relevant for the motivation, efforts and quality of health care provision.

Daneshkohan et al. (2014) conducted a cross-sectional survey with health workers in Iran and showed that the main motivating factors for health workers were good management, supervisors and managers' support and good working relationship with colleagues. In contrast, unfair treatment, poor management and lack of appreciation were the main demotivating factors. Strengthening management capacities in health services can increase job motivation and improve the performance of health workers. Special attention should be paid to some aspects such as management competencies, social support in the workplace, treating employees fairly and performance management practices, especially supervision and performance appraisal.

Grienfield et al (2015) showed that national accreditation reform can engender widespread stakeholder support, but implementation challenges must be overcome. In particular, the fundamental role of continued stakeholder engagement increases the likelihood that such reforms are taken up and spread across health systems. Another form of external non-financial motivation are audits (Gude et al. 2016). When confronted with clinical performance feedback, performance scores and benchmark comparisons influenced health professionals' intentions to improve practice.

Importantly, there was substantial variation in these intentions, because professionals disagreed with benchmarks, deemed improvement unfeasible or did not consider the indicator an essential aspect of care quality. Moreover, Toffolutti et al. (2016) showed that a "game" element is often present in audits, that are considered a key means to monitor and ensure quality of care and maintain high standards in healthcare. When staff know that an audit will soon take place, hospitals spend more attention to the elements that will be assessed during the audit. Regan et al. (2015) conducted a policy analysis of health professions regulations for interprofessional collaboration in Ontario, Canada, and showed that there were many concerns about the lack of clarity regarding the intent of legislation. In addition, barriers stemming from long-standing issues in practice, including scope of practice protection, conflicting legislation, and lack of knowledge about the roles of other health professionals impede interprofessional collaboration.

Conclusion

Considering that the systematic literature review has shown that health professionals are more pro-social than other professionals, it is of great importance to take into account the professional when implementing regulations or external incentives. For example, while financial incentives or regulations can have a negative effect on the motivation and decisions of healthcare professionals, and ultimately also on the healthcare outcomes, non-financial incentives provide a more holistic approach, as they take other motivation factors into account.

Motivation

In general, motivation to conduct pro-social behaviour is essential for the long term (Franco, Bennett, & Kanfer 2002). It develops in each individual based on the interaction of individual, organisation and cultural determinants. Some of the factors are of a more distal nature, such as cultural norms and values and individual personality, hence they lie outside the scope of HRM and regulations. Orsini et al (2016) have conducted a systematic review analysing determinants and outcomes of motivation in health professionals' education. Intrapersonal (gender and personality traits) and interpersonal determinants (academic conditions and lifestyle, qualitative method of selection, feedback, and a supportive learning climate) have been reported to have a positive influence on students' motivation to engage in academic activities. The result from this systematic review showed that motivation of medical students could be enhanced by changing the educational environment and by an early detection of students' characteristics.

For example, Apathy and Yeager (2019) showed that motivation for public health workers to seek out training was mostly personal growth (82.7 % of respondents). Four motivational classes were clustered, (1) those motivated by organisational pressure and requirements, (2) those motivated indiscriminately by all factors, (3) those motivated primarily by personal growth and (4) those motivated by organisational accommodations and support. Furthermore, the results showed that public health agencies should consider the different motivational classes that were distinguished by Apathy and Yeager in the public health workforce because all groups should be motivated to participate in trainings. Hammig (2018) shows that factors related to effort-reward and work-life imbalances are important factors reported by health practitioners that lead to burnout and the intention to leave the profession.

A recent laboratory and field experiment investigated whether health workers have intrinsic motivation to help their patients confirm that pro-social behaviour can be induced (Brock et al 2016). The authors observed clinicians 1) in their normal work environment, 2) when a peer observes them and 3) 6 weeks after an encouragement visit from a peer. They found that clinicians who give at least half of their endowment to a stranger in the laboratory (generous) provide 8% better quality care. In addition, the average clinician provides about 3% better quality when observed by a peer and 8% higher quality care after the encouragement visit. Importantly, they found that generous clinicians react to peer scrutiny and encouragement in the same way as non-generous clinicians. Many clinicians are intrinsically motivated to provide higher quality care; however, most clinicians respond to increased prosocial incentives in the form of scrutiny and encouragement from peers. These findings are important since they imply that healthcare institutions, through correct incentives, can also influence prosocial behaviour.

As Maynard (2007) states in an opinion article, there exists a great challenge not to eradicate what is impossible to remove but how to channel the great power of self-

interest to serve the individual and the public good. The difficulty lies in the fact that, as Neumann et al. (2009) clearly show, that there exists a large gap between academic researchers (in particular economists) and public health practitioners in measuring the "value" of the public health service. On the other hand, Scanlan et al (2019) showed that rewards and recognition, job control, feedback, and participation were associated with burnout, turnover intention and job satisfaction. In addition, the job demands and emotional demands, shift work, and work-home interference were association with more exhaustion and subsequently with burnout.

Conclusion

Motivational aspects that are not related to financial or non-financial incentives are an important element of the level or pro-social behaviour of health professionals, in particular in the long run. Studies have shown that different elements should be taken into account when considering how to best motivate health professionals to act on behalf of the patient and society.

ANNEX 3: ECONOMETRIC AND STATISTICAL ANALYSIS

The econometric and statistical analyses that we conducted followed the Rubin Causal Model notation (Rubin, 1974, 1975, 1978). Given the outcome variable Y, we denote Y_i^{obs} as the observed outcome for subject i. For instance, the observed outcome could be the likelihood of getting a correct diagnosis or a correct prescription. To have a clear understanding of the interpretation of the model, we deployed an algebraic analysis for the model used in this study.

First, note that the experiment has six experimental conditions. Three between-subject conditions, namely: Control, Market competition, and Peer competition, and two within-subject conditions, namely: private payment and health system payment. Treatment status is defined by the variable D^t where t refers to one of the six experimental conditions. This variable has the value of 1 where subject i is treated and has the value of 0 where subject i is no treated in each condition. For example, $D^{market} = 1$ means subject i faces the market competition treatment. We will specify the notation for the observed outcome (Y_i^{obs}) as $Y_{between}^{within}$ where on the subscript you can find the between-subject condition, while on the superscript you can find the within-subject condition. For instance, $Y_{market}^{private}$ is the observed outcome for subject i when she faces market competition and private payment conditions.

Now, we can define the switching regression for our model:

$$\begin{aligned} Y = D^{private}\Big[D^{market} * Y_{market}^{private} + (1 - D^{market})\big[D^{peer} * Y_{peer}^{private} + (1 - D^{peer}) * Y_{control}^{private}\big]\Big] \\ + (1 - D^{private})\Big[D^{market} * Y_{market}^{health\ system} \\ + (1 - D^{market})\big[D^{peer} * Y_{peer}^{health\ system} + (1 - D^{peer}) * Y_{control}^{health\ system}\big]\Big] \end{aligned}$$

Notice that we are simply applying the definitions of the potential outcomes and the variable D^t. This formula indicates which outcome we are observing under each condition. For example, if $D^{private} = 1$ and $D^{market} = 1$ the equation will be $Y = Y_{market}^{private}$.

By simple algebra, adding and subtracting some terms, we can rewrite the equation as61:

$$\begin{aligned} Y = Y_{control}^{health\ system} + D^{market}(Y_{market}^{health\ system} - Y_{control}^{health\ system}) + D^{peer}(Y_{peer}^{health\ system} - Y_{control}^{health\ system}) \\ + D^{private}(Y_{control}^{private} - Y_{control}^{health\ system}) + D^{private}D^{market}[(Y_{market}^{private} - Y_{control}^{private}) \\ - (Y_{market}^{health\ system} - Y_{control}^{health\ system})] + D^{private}D^{peer}[(Y_{peer}^{private} - Y_{control}^{private}) \\ - (Y_{peer}^{health\ system} - Y_{control}^{health\ system})] \end{aligned}$$

Note that this equation is for the subject i. However, it is not possible to observe the same individual in all the conditions, so we cannot estimate the impacts of the experimental conditions for each subject. So that, we estimate impacts of the experimental conditions at a group level. To do this, we calculate the expected value for the equation. Doing this and redefining some notations, we can restate the equation as:

[61] Note that by adding some differences we can find other interesting comparisons. For instance: $[Y_{market}^{health\ system} - Y_{control}^{health\ system}] + [(Y_{market}^{private} - Y_{control}^{private}) - (Y_{market}^{health\ system} - Y_{control}^{health\ system})] = Y_{market}^{private} - Y_{control}^{private}$. $[Y_{peer}^{health\ system} - Y_{control}^{health\ system}] + [(Y_{peer}^{private} - Y_{control}^{private}) - (Y_{peer}^{health\ system} - Y_{control}^{health\ system})] = Y_{peer}^{private} - Y_{control}^{private}$. $(Y_{control}^{private} - Y_{control}^{health\ system}) + [(Y_{market}^{private} - Y_{control}^{private}) - (Y_{market}^{health\ system} - Y_{control}^{health\ system})] = Y_{market}^{private} - Y_{market}^{health\ system}$. $(Y_{control}^{private} - Y_{control}^{health\ system}) + [(Y_{peer}^{private} - Y_{control}^{private}) - (Y_{peer}^{health\ system} - Y_{control}^{health\ system})] = Y_{peer}^{private} - Y_{peer}^{health\ system}$.

$$Y_i = \beta_0 + \beta_1 Market\ Competition_i + \beta_2 Peer\ Competition_i + \beta_3 Private\ payment_i + \beta_4 Private\ payment_i * Market\ Competition_i + \beta_4 Private\ payment_i * Peer\ Competition_i + X_i\gamma + \varepsilon_i \quad [1]$$

Where the interpretation of the coefficients is straightforward, β_1 is the average causal impact of the market competition condition on the outcome variable of interest under the health system payment scheme, i.e. $E(Y_{market}^{health\ system}) - \mathrm{E}(Y_{control}^{health\ system})$. β_2 is the average causal impact of the peer competition condition on the outcome variable of interest under the health system payment scheme, this is, $E(Y_{peer}^{health\ system}) - \mathrm{E}(Y_{control}^{health\ system})$. β_3 is the average causal impact of the private payment condition on the outcome variable of interest under the control condition, this is, $E(Y_{control}^{private}) - \mathrm{E}(Y_{control}^{health\ system})$. β_4 is the difference between the impact of the market competition condition on the outcome variable of interest in the private payment scheme versus the impact of the market competition in the health system payment scheme, this is, $[\mathrm{E}(Y_{market}^{private}) - \mathrm{E}(Y_{control}^{private}) - (\mathrm{E}(Y_{market}^{health\ system}) - \mathrm{E}(Y_{control}^{health\ system})]$. β_5 is difference between the impact of the peer competition condition on the outcome variable of interest in the private payment scheme versus the impact of the peer competition in the health system payment scheme, this is, $[\mathrm{E}(Y_{peer}^{private}) - \mathrm{E}(Y_{control}^{private}) - (\mathrm{E}(Y_{peer}^{health\ system}) - \mathrm{E}(Y_{control}^{health\ system})]$. X_i is a vector that includes all the covariates observed in the experiment (i.e. Demographics, individual preferences, medical behaviour, and entrepreneurship preferences), so γ is a vector that includes the estimators for all these variables. Finally, ε_i is the error term. If the experimental condition is assigned through randomisation, the expected residual on all groups is zero.

In other words, by defining the potential outcome and experimental conditions, we end up with a linear model for the observed outcome which is independent of the scale of the variable and of the real structural model that generates the data. As a result, the equation above can be estimated by OLS under randomisation. To sum up, the estimated coefficient of the dummy for an experimental condition shows, the value of the average causal impact of that condition. This model is estimated through OLS with clustered standard errors. We use clustered standard errors because the experimental condition is assigned at the session-level.

We also estimate a second model to identify the main effect of the six experimental conditions. The model specification is:

$$Y_i = \delta_0 + \delta_1 Market\ Competition_i + \delta_2 Peer\ Competition_i + \delta_3 Private\ payment_i + X_i\gamma + \varepsilon_i \quad [2]$$

Note that the specification is like the first model, however the interpretation of the coefficient's changes. δ_0 is the average value of the outcome of interest in the control group. δ_1 is the main effect of the market competition treatment on the outcome of interest with respect to the control group. δ_2 is the main effect of peer competition treatment on outcome variable of interest with respect to the control group. δ_3 is the main effect of private payment scheme on outcome variable of interest with respect to health system payment scheme.

ANNEX 4: FULL REGRESSION MODELS

The full regression models for the Spanish doctors, including the covariates.

Table 54 - Treatment effects on the time spent in solving the case including covariates, Spain

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	28.62*	25.24	27.71*	28.96*	28.62*	27.06*
	(16.66)	(15.79)	(16.40)	(16.67)	(16.66)	(15.88)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	8.17	4.79	7.26	8.51	8.16	6.61
	(15.10)	(14.82)	(14.58)	(15.84)	(14.94)	(14.26)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	-4.16	-2.79	-2.42	-1.28	-2.33	3.72
	(14.83)	(13.99)	(14.28)	(14.39)	(15.12)	(14.05)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-16.26	-14.88	-14.51	-13.37	-14.42	-8.38
	(12.57)	(12.01)	(12.57)	(12.22)	(12.87)	(11.80)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system})$	-9.53	-9.53	-9.53	-9.53	-9.53	-9.53
	(14.85)	(14.95)	(14.92)	(14.89)	(14.87)	(15.06)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system})$	-29.97***	-29.97***	-29.97***	-29.97***	-29.98***	-29.97***
	(8.36)	(8.36)	(8.41)	(8.38)	(8.37)	(8.48)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system})$	-21.62***	-21.62***	-21.62***	-21.62***	-21.62***	-21.62***
	(7.03)	(7.01)	(7.06)	(7.05)	(7.03)	(7.11)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}))$	-20.45	-20.45	-20.45	-20.45	-20.45	-20.45

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case
	(17.04)	(17.16)	(17.12)	(17.09)	(17.07)	(17.28)
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}))$	-12.09	-12.09	-12.09	-12.09	-12.09	-12.09
	(16.42)	(16.54)	(16.50)	(16.47)	(16.45)	(16.66)
Order		-10.86	-6.90	-9.12	-7.32	-15.60*
		(10.42)	(9.42)	(8.87)	(9.66)	(8.71)
Female		8.04				8.27
		(9.60)				(9.50)
Age		2.70				2.74
		(2.83)				(2.72)
Married		-11.03				-15.52
		(11.40)				(10.46)
Partner doctor		-1.13				4.59
		(8.87)				(8.28)
Years since degree		-1.27				-1.07
		(2.68)				(2.47)
Specialist		40.42*				88.96***
		(22.35)				(21.26)
Years of experience in the specialty field		-26.75				-31.88
		(19.19)				(21.08)
Years of experience in current job		25.74*				19.30
		(15.04)				(17.25)
Family doctors		-15.18				-8.90

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case
		(9.39)				(9.29)
Income perception (in-group)		1.36				0.02
		(3.60)				(3.40)
Income perception (out-group)		-0.66				2.62
		(4.50)				(4.41)
Risk aversion			-8.18			-2.41
			(6.21)			(6.66)
Financial risk aversion			7.00			7.02
			(4.86)			(4.91)
Time preference			3.02			3.10
			(4.49)			(4.79)
Inequality aversion			-3.84			-1.99
			(4.83)			(4.99)
Political participation			6.22			1.85
			(10.28)			(10.03)
Reciprocity			0.97			1.34*
			(0.72)			(0.69)
Altruism			-0.28			-0.23
			(0.30)			(0.31)
Prescribe generic drugs				-33.11		-27.00
				(27.50)		(24.48)
Research generic drugs				-8.29		-10.96
				(11.14)		(10.87)
Dealing with pharmacists				0.07		4.73

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case
				(11.74)		(11.34)
Drug name reason to prescribe				-32.38***		-29.12***
				(7.83)		(7.39)
Entrepreneurship experience					16.56	16.19
					(12.38)	(11.32)
Entrepreneurship intention					-17.48*	-20.91*
					(10.58)	(11.09)
Constant	96.59***	-31.78	88.68***	147.13***	98.66***	-93.19
	(12.47)	(79.82)	(28.57)	(26.30)	(16.82)	(96.78)
Observations	900	900	900	900	900	900
Number of id	150	150	150	150	150	150
Individual random effects	YES	YES	YES	YES	YES	YES

Source: Authors' elaboration.

Table 55 - Treatment effect on likelihood of getting the high bonus including covariates, Spain

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	-0.14**	-0.13*	-0.13**	-0.14**	-0.14**	-0.14**
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.06)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	-0.10*	-0.09	-0.09	-0.10*	-0.10*	-0.10*
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	-0.08	-0.08	-0.08	-0.09	-0.09	-0.10
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-0.00	-0.00	-0.00	-0.00	-0.00	-0.02
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system})$	0.07*	0.07*	0.07*	0.07*	0.07*	0.07*
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system})$	0.12**	0.12**	0.12**	0.12**	0.12**	0.12**
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system})$	0.16***	0.16***	0.16***	0.16***	0.16***	0.16***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}))$	0.04	0.04	0.04	0.04	0.04	0.04
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}))$	0.09	0.09	0.09	0.09	0.09	0.09
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Order		0.06	0.04	0.05	0.03	0.10**
		(0.05)	(0.04)	(0.04)	(0.04)	(0.04)
Female		-0.08				-0.10*
		(0.05)				(0.05)
Age		-0.01				-0.01
		(0.01)				(0.01)
Married		0.06				0.07
		(0.06)				(0.05)
Partner doctor		-0.01				-0.03
		(0.05)				(0.04)
Years since degree		0.01				0.01
		(0.01)				(0.01)
Specialist		-0.18*				-0.33***
		(0.10)				(0.12)
Years of experience in the specialty field		0.08				0.11
		(0.09)				(0.11)
Years of experience in current job		-0.16**				-0.16**
		(0.06)				(0.07)
Family doctors		0.08				0.06
		(0.05)				(0.05)
Income perception (in-group)		-0.01				-0.00

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**
		(0.01)				(0.01)
Income perception (out-group)		0.01				-0.01
		(0.02)				(0.02)
Risk aversion			0.02			-0.01
			(0.03)			(0.03)
Financial risk aversion			0.01			0.01
			(0.02)			(0.02)
Time preference			-0.03			-0.03
			(0.02)			(0.02)
Inequality aversion			0.03			0.03
			(0.03)			(0.02)
Political participation			0.02			0.05
			(0.05)			(0.05)
Reciprocity			-0.01*			-0.01*
			(0.00)			(0.00)
Altruism			0.00			-0.00
			(0.00)			(0.00)
Prescribe generic drugs				0.13		0.12
				(0.09)		(0.09)
Research generic drugs				0.06		0.07
				(0.05)		(0.06)
Dealing with pharmacists				-0.01		-0.06
				(0.05)		(0.05)
Drug name reason to prescribe				0.15***		0.14***
				(0.04)		(0.04)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**
Entrepreneurship experience					-0.10*	-0.14***
					(0.06)	(0.05)
Entrepreneurship intention					0.07	0.05
					(0.05)	(0.05)
Constant	0.79***	1.28***	0.81***	0.55***	0.79***	1.51***
	(0.05)	(0.27)	(0.13)	(0.11)	(0.06)	(0.41)
Observations	900	900	900	900	900	900
Number of id	150	150	150	150	150	150
Individual random effects	YES	YES	YES	YES	YES	YES

Source: Authors' elaboration.

Table 56 - Treatment effect on likelihood of getting at least one bonus including covariates, Spain

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	-0.04	-0.03	-0.04	-0.04	-0.04	-0.04
	(0.05)	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	0.02	0.01	0.02	0.01	0.01	-0.00
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	0.02	0.01	0.02	0.01	0.01	-0.00
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system})$	0.02	0.02	0.02	0.02	0.02	0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system})$	0.04	0.04	0.04	0.04	0.04	0.04
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system})$	0.02	0.02	0.02	0.02	0.02	0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}))$	0.02	0.02	0.02	0.02	0.02	0.02
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}))$	0.00	0.00	0.00	0.00	0.00	0.00
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Order		-0.00	-0.01	-0.00	-0.01	0.00
		(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
Female		-0.04				-0.05
		(0.03)				(0.04)
Age		-0.01				-0.01
		(0.01)				(0.01)
Married		-0.03				-0.02
		(0.03)				(0.03)
Partner doctor		0.00				-0.00
		(0.03)				(0.03)
Years since degree		0.01				0.01
		(0.01)				(0.01)
Specialist		0.01				-0.08
		(0.05)				(0.07)
Years of experience in the specialty field		0.03				0.03
		(0.05)				(0.06)
Years of experience in current job		-0.01				0.00
		(0.05)				(0.05)
Family doctors		0.05*				0.04
		(0.03)				(0.03)
Income perception (in-		0.00				0.00

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**
group)						
		(0.01)				(0.01)
Income perception (out-group)		0.00				-0.00
		(0.01)				(0.01)
Risk aversion			0.03*			0.01
			(0.02)			(0.02)
Financial risk aversion			-0.01			-0.01
			(0.01)			(0.01)
Time preference			0.01			0.01
			(0.01)			(0.01)
Inequality aversion			-0.01			-0.01
			(0.01)			(0.02)
Political participation			0.02			0.03
			(0.03)			(0.03)
Reciprocity			-0.00			-0.00
			(0.00)			(0.00)
Altruism			-0.00			-0.00
			(0.00)			(0.00)
Prescribe generic drugs				0.07		0.05
				(0.08)		(0.07)
Research generic drugs				0.04		0.04
				(0.04)		(0.04)
Dealing with pharmacists				-0.00		-0.02
				(0.03)		(0.03)
Drug name reason to				0.06**		0.05**

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**
prescribe						
				(0.03)		(0.03)
Entrepreneurship experience					-0.06*	-0.07*
					(0.04)	(0.04)
Entrepreneurship intention					0.07**	0.05
					(0.03)	(0.04)
Constant	0.91***	1.20***	0.87***	0.80***	0.92***	1.24***
	(0.03)	(0.19)	(0.07)	(0.08)	(0.04)	(0.27)
Observations	900	900	900	900	900	900
Number of id	150	150	150	150	150	150
Individual random effects	YES	YES	YES	YES	YES	YES

Source: Authors' elaboration.

Table 57 - Treatment effect on likelihood of getting a correct diagnosis including covariates, Spain

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}$	0.01	0.02	0.01	0.01	0.01	0.01
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	-0.02	-0.00	-0.02	-0.02	-0.02	-0.02
	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}$	-0.05	-0.04	-0.04	-0.07	-0.05	-0.04
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-0.09	-0.08	-0.09	-0.11*	-0.09	-0.09
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system}$	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system}$	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system}$	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ systen} - E(Y_{control}^{health\ system}$	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system} - E(Y_{control}^{health\ system}$	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Order		-0.06	-0.05	-0.06	-0.05	-0.05
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Female		0.03				0.02
		(0.04)				(0.04)
Age		-0.00				0.00
		(0.01)				(0.01)
Married		0.02				0.02
		(0.04)				(0.04)
Partner doctor		-0.01				-0.01
		(0.04)				(0.03)
Years since degree		-0.00				-0.00
		(0.01)				(0.01)
Specialist		-0.29***				-0.21*
		(0.10)				(0.12)
Years of experience in the specialty field		-0.01				-0.02
		(0.09)				(0.09)
Years of experience in current job		-0.03				-0.03
		(0.06)				(0.07)
Family doctors		0.00				0.00
		(0.05)				(0.05)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**
Income perception (in-group)		-0.02				-0.01
		(0.01)				(0.01)
Income perception (out-group)		0.01				0.00
		(0.01)				(0.01)
Risk aversion			-0.01			-0.01
			(0.02)			(0.02)
Financial risk aversion			-0.00			-0.00
			(0.02)			(0.02)
Time preference			0.03			0.03
			(0.02)			(0.02)
Inequality aversion			-0.00			-0.01
			(0.02)			(0.02)
Political participation			0.02			0.02
			(0.04)			(0.04)
Reciprocity			0.00			-0.00
			(0.00)			(0.00)
Altruism			-0.00			0.00
			(0.00)			(0.00)
Prescribe generic drugs				0.08**		0.08**
				(0.03)		(0.04)
Research generic drugs				-0.17***		-0.14***
				(0.05)		(0.05)
Dealing with pharmacists				0.02		0.01

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**
				(0.04)		(0.05)
Drug name reason to prescribe				0.01		0.03
				(0.04)		(0.04)
Entrepreneurship experience					0.01	0.03
					(0.04)	(0.05)
Entrepreneurship intention					-0.01	-0.01
					(0.04)	(0.05)
Constant	0.52***	0.92***	0.48***	0.61***	0.54***	0.79**
	(0.04)	(0.20)	(0.13)	(0.06)	(0.05)	(0.32)
Observations	900	900	900	900	900	900
Number of id	150	150	150	150	150	150

Source: Authors' elaboration.

Table 58 - Treatment effect on likelihood of getting a correct prescription including covariates, Spain

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**
$E(Y_{market}^{health\ system} - E(Y_{control}^{health\ syst}$	0.15**	0.17***	0.16***	0.15**	0.15**	0.17***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	0.00	0.02	0.00	0.00	0.00	0.02
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{health\ system} - E(Y_{control}^{health\ syst}$	0.03	0.06	0.04	0.02	0.03	0.05
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ syst}$	0.09	0.09	0.09	0.09	0.09	0.09
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ syst}$	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ syst}$	0.03	0.03	0.03	0.03	0.03	0.03
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ sys} - E(Y_{control}^{health\ syst}$	-0.15*	-0.15*	-0.15*	-0.15*	-0.15*	-0.15*
	(0.08)	(0.09)	(0.08)	(0.08)	(0.08)	(0.09)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ sys} - E(Y_{control}^{health\ syst}$	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Order		-0.02	-0.01	-0.02	-0.01	-0.02
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Female		0.05				0.03
		(0.03)				(0.04)
Age		0.01				0.01
		(0.01)				(0.01)
Married		0.02				0.01
		(0.04)				(0.04)
Partner doctor		-0.01				-0.01
		(0.04)				(0.04)
Years since degree		-0.01				-0.01
		(0.01)				(0.01)
Specialist		-0.18**				-0.09
		(0.09)				(0.10)
Years of experience in the specialty field		-0.12				-0.11
		(0.10)				(0.09)
Years of experience in current job		-0.02				-0.02
		(0.08)				(0.08)
Family		-0.07				-0.07

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**
doctors						
		(0.05)				(0.05)
Income perception (in-group)		-0.01				-0.01
		(0.01)				(0.01)
Income perception (out-group)		0.01				0.01
		(0.01)				(0.01)
Risk aversion			-0.04**			-0.04**
			(0.02)			(0.02)
Financial risk aversion			0.02			0.02
			(0.02)			(0.02)
Time preference			-0.00			0.00
			(0.02)			(0.02)
Inequality aversion			0.01			0.01
			(0.02)			(0.02)
Political participation			-0.04			-0.04
			(0.04)			(0.04)
Reciprocity			0.00			0.00
			(0.00)			(0.00)
Altruism			-0.00			0.00
			(0.00)			(0.00)
Prescribe generic drugs				0.03		0.03
				(0.06)		(0.05)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**
Research generic drugs				-0.17***		-0.14***
				(0.04)		(0.04)
Dealing with pharmacists				0.02		0.02
				(0.04)		(0.04)
Drug name reason to prescribe				-0.00		0.01
				(0.04)		(0.04)
Entrepreneurship experience					-0.01	0.00
					(0.04)	(0.05)
Entrepreneurship intention					0.01	0.01
					(0.05)	(0.05)
Constant	0.33***	0.42**	0.39***	0.44***	0.33***	0.44
	(0.04)	(0.19)	(0.12)	(0.08)	(0.05)	(0.27)
Observations	900	900	900	900	900	900
Number of id	150	150	150	150	150	150
Individual random effects	YES	YES	YES	YES	YES	YES

Source: Authors' elaboration.

Table 59 - Treatment effect on likelihood of prescribing generic drugs including covariates, Spain

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	P(prescribe generic drugs)	P(prescribe generic drugs)	P(prescribe generic drugs)	P(prescribe generic drugs)	P(prescribe generic drugs)	P(prescribe generic drugs)
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ syster}$	0.08*	0.09**	0.08*	0.08*	0.08*	0.09**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	0.00	0.00	0.02	0.00	0.00	0.02
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ syster}$	0.03	0.05	0.03	0.03	0.03	0.04
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-0.02	-0.00	-0.02	-0.02	-0.02	-0.01
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ syster}$	0.05	0.05	0.05	0.05	0.05	0.05
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ syster}$	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ syster}$	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ syste} - E(Y_{control}^{health\ syster}$	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)

$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ syste} - E(Y_{control}^{health\ syster}$	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Order		0.00	0.00	0.01	0.02	-0.00
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Female		0.07***				0.08***
		(0.02)				(0.02)
Age		-0.00				-0.00
		(0.01)				(0.01)
Married		0.01				0.00
		(0.03)				(0.02)
Partner doctor		-0.01				-0.00
		(0.02)				(0.03)
Years since degree		0.00				-0.00
		(0.00)				(0.01)
Specialist		0.11*				0.02
		(0.06)				(0.08)
Years of experience in the specialty field		-0.02				0.04
		(0.06)				(0.06)
Years of experience in current job		-0.00				-0.01
		(0.05)				(0.05)
Family doctors		-0.01				-0.02
		(0.03)				(0.03)
Income perception (in-group)		0.01				0.01
		(0.01)				(0.01)

Income perception (out-group)		-0.02**				-0.02**
		(0.01)				(0.01)
Risk aversion			-0.02			-0.01
			(0.01)			(0.01)
Financial risk aversion			-0.01			-0.02
			(0.01)			(0.01)
Time preference			-0.01			-0.02
			(0.01)			(0.01)
Inequality aversion			-0.01			-0.02
			(0.01)			(0.01)
Political participation			-0.00			0.00
			(0.03)			(0.03)
Reciprocity			0.00			0.00
			(0.00)			(0.00)
Altruism			-0.00			0.00
			(0.00)			(0.00)
Prescribe generic drugs				0.06		0.06
				(0.04)		(0.04)
Research generic drugs				-0.00		-0.00
				(0.03)		(0.03)
Dealing with pharmacists				0.02		0.03
				(0.02)		(0.02)
Drug name reason to prescribe				-0.02		-0.00
				(0.03)		(0.02)
Entrepreneurship experience					-0.03	0.00

					(0.03)	(0.03)
Entrepreneur ship intention					0.07**	0.09***
					(0.03)	(0.03)
Constant	0.81***	0.86***	0.93***	0.76***	0.80***	0.97***
	(0.03)	(0.15)	(0.09)	(0.06)	(0.03)	(0.20)
Observations	900	900	900	900	900	900
Number of id	150	150	150	150	150	150
Individual random effects	YES	YES	YES	YES	YES	YES

Source: Authors' elaboration.

The full regression models for the Spanish patients, including the covariates

Table 60 - Treatment effect on likelihood of following doctor's prescription including covariates, Spain

	(1)	(2)	(3)	(4)
VARIABLES	**P(following doctor prescription)**	**P(following doctor prescription)**	**P(following doctor prescription)**	**P(following doctor prescription)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	0.12***	0.12***	0.13***	0.12***
	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	0.19***	0.18***	0.19***	0.19***
	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	-0.04	-0.03	-0.03	-0.02
	(0.04)	(0.04)	(0.05)	(0.05)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-0.04	-0.04	-0.04	-0.04
	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system})$	-0.15***	-0.15***	-0.15***	-0.15***
	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system})$	-0.08**	-0.08**	-0.08**	-0.08**
	(0.03)	(0.03)	(0.03)	(0.03)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system})$	-0.17***	-0.17***	-0.17***	-0.17***
	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}))$	0.06	0.06	0.06	0.06
	(0.05)	(0.05)	(0.05)	(0.05)

	(1)	(2)	(3)	(4)
VARIABLES	**P(following doctor prescription)**	**P(following doctor prescription)**	**P(following doctor prescription)**	**P(following doctor prescription)**
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}))$	-0.02	-0.02	-0.02	-0.02
	(0.06)	(0.06)	(0.06)	(0.06)
Order		0.04	0.03	0.03
		(0.03)	(0.03)	(0.03)
Female		0.00		0.01
		(0.03)		(0.03)
Age		0.00		0.00
		(0.00)		(0.00)
Married		-0.01		-0.02
		(0.03)		(0.03)
Risk aversion			-0.01	-0.01
			(0.02)	(0.02)
Financial risk aversion			0.01	0.01
			(0.01)	(0.01)
Time preference			0.02	0.02
			(0.01)	(0.01)
Inequality aversion			-0.03*	-0.03*
			(0.01)	(0.02)
Political participation			0.01	0.02
			(0.03)	(0.03)
Reciprocity			-0.00	-0.00
			(0.00)	(0.00)
Altruism			0.00	0.00
			(0.00)	(0.00)
Constant	0.78***	0.74***	0.81***	0.77***
	(0.03)	(0.07)	(0.09)	(0.13)

	(1)	(2)	(3)	(4)
VARIABLES	**P(following doctor prescription)**	**P(following doctor prescription)**	**P(following doctor prescription)**	**P(following doctor prescription)**
Observations	900	900	900	900
Number of id	150	150	150	150
Individual random effects	YES	YES	YES	YES

Source: Authors' elaboration.

The full regression models for the Dutch doctors, including the covariates

Table 61 - Treatment effects on the time spent in solving the case including covariates, the Netherlands

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	-6.53	-3.30	-7.90	-5.29	-3.37	-3.25
	(10.22)	(9.92)	(9.82)	(10.22)	(10.36)	(9.77)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	9.79	13.02	8.43	11.04	12.96	13.07
	(10.43)	(10.50)	(10.19)	(10.64)	(10.71)	(10.11)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	-7.56	-9.03	-5.32	-5.36	-5.81	-8.79
	(10.18)	(10.82)	(10.15)	(10.32)	(10.19)	(11.15)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-3.02	-4.49	-0.78	-0.81	-1.27	-4.24
	(9.63)	(9.57)	(10.15)	(10.19)	(9.69)	(10.52)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system})$	-19.91***	-19.91***	-19.91***	-19.91***	-19.91***	-19.91***
	(4.62)	(4.65)	(4.64)	(4.63)	(4.63)	(4.68)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system})$	-3.58	-3.58	-3.58	-3.58	-3.58	-3.58
	(5.59)	(5.63)	(5.61)	(5.61)	(5.60)	(5.67)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system})$	-15.36**	-15.36**	-15.36**	-15.36**	-15.36**	-15.36**
	(6.59)	(6.63)	(6.62)	(6.61)	(6.60)	(6.68)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}))$	16.32**	16.32**	16.32**	16.32**	16.32**	16.32**
	(7.25)	(7.30)	(7.29)	(7.27)	(7.27)	(7.36)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}))$	4.54	4.54	4.54	4.54	4.54	4.54
	(8.05)	(8.11)	(8.09)	(8.07)	(8.07)	(8.17)
Order		-1.45	-6.21	-7.32	-5.42	-0.24
		(7.73)	(7.93)	(7.94)	(7.89)	(8.29)
Female		8.02				4.68
		(7.47)				(7.79)
Age		-1.38				-1.26
		(0.87)				(0.87)
Married		-10.32				-7.71
		(10.21)				(10.88)
Partner doctor		-0.77				-4.22
		(10.56)				(10.27)
Years since degree		0.46***				0.51***
		(0.14)				(0.17)
Specialist		-23.07**				-24.22**
		(11.31)				(11.89)
Years of experience in the specialty field		49.64				52.10
		(42.62)				(41.69)
Years of experience in current job		2.82				0.47
		(43.48)				(42.53)
Family doctors		-17.43*				-19.67**
		(9.50)				(8.78)
Income perception (in-		-0.96				-0.41

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case
group)						
		(2.43)				(2.57)
Income perception (out-group)		-2.60				-3.47
		(2.48)				(2.54)
Risk aversion			-10.12**			-7.53*
			(4.38)			(4.38)
Financial risk aversion			6.83			7.94*
			(4.35)			(4.52)
Time preference			7.41			6.75
			(5.99)			(5.46)
Inequality aversion			0.27			-1.48
			(5.22)			(5.16)
Political participation			-5.61			-5.77
			(8.41)			(8.33)
Reciprocity			0.44			0.48
			(0.51)			(0.48)
Altruism			0.48			0.58
			(0.34)			(0.36)
Prescribe generic drugs				-6.02		10.56
				(9.18)		(9.95)
Research generic drugs				-4.49		-5.95
				(8.00)		(7.34)
Dealing with pharmacists				1.59		6.41
				(7.99)		(7.62)
Drug name				2.62		1.39

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case	Time spent in solving the case
reason to prescribe						
				(9.78)		(9.81)
Entrepreneurship experience					-1.92	-10.83
					(12.54)	(14.39)
Entrepreneurship intention					-11.09	-4.73
					(11.35)	(11.52)
Constant	128.56***	202.59***	106.75***	135.18***	133.15***	171.31***
	(6.99)	(24.23)	(29.49)	(10.02)	(7.85)	(36.54)
Observations	912	912	912	912	912	912
Number of id	152	152	152	152	152	152
Individual random effects	YES	YES	YES	YES	YES	YES

Source: Authors' elaboration.

Table 62 - Treatment effect on likelihood of getting the high bonus including covariates, the Netherlands

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	-0.02	-0.04	-0.01	-0.03	-0.04	-0.03
	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)	(0.07)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	-0.03	-0.03	-0.05	-0.02	-0.04	-0.05
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	0.02	0.03	0.01	0.01	0.01	0.04
	(0.07)	(0.08)	(0.07)	(0.07)	(0.07)	(0.08)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	0.07	0.07	0.06	0.05	0.06	0.08
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system})$	0.05	0.05	0.05	0.05	0.05	0.05
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system})$	0.04	0.04	0.04	0.04	0.04	0.04
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system})$	0.10**	0.10**	0.10**	0.10**	0.10**	0.10**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}))$	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}))$	0.05	0.05	0.05	0.05	0.05	0.05
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Order		0.01	0.04	0.05	0.04	0.00
		(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Female		-0.02				-0.00
		(0.05)				(0.06)
Age		0.01				0.01
		(0.01)				(0.01)
Married		0.08				0.08
		(0.07)				(0.08)
Partner doctor		0.05				0.07
		(0.07)				(0.07)
Years since degree		-0.00**				-0.00**
		(0.00)				(0.00)
Specialist		0.12				0.13
		(0.08)				(0.09)
Years of experience in the specialty field		-0.32				-0.34
		(0.34)				(0.33)
Years of experience in current job		-0.05				0.01
		(0.35)				(0.34)
Family doctors		0.09				0.11
		(0.07)				(0.07)
Income perception (in-group)		0.01				0.01

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**
		(0.02)				(0.02)
Income perception (out-group)		0.01				0.01
		(0.02)				(0.02)
Risk aversion			0.07**			0.05
			(0.03)			(0.04)
Financial risk aversion			-0.05			-0.05
			(0.03)			(0.03)
Time preference			-0.07			-0.06
			(0.04)			(0.04)
Inequality aversion			0.01			0.02
			(0.04)			(0.04)
Political participation			0.01			0.01
			(0.06)			(0.06)
Reciprocity			-0.00			-0.00
			(0.00)			(0.00)
Altruism			-0.00			-0.00
			(0.00)			(0.00)
Prescribe generic drugs				0.03		-0.07
				(0.06)		(0.08)
Research generic drugs				0.02		0.04
				(0.06)		(0.06)
Dealing with pharmacists				0.00		-0.02
				(0.06)		(0.06)
Drug name reason to prescribe				0.01		0.03
				(0.07)		(0.07)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**	**P(get high bonus)**
Entrepreneurship experience					0.02	0.03
					(0.09)	(0.10)
Entrepreneurship intention					0.03	-0.01
					(0.08)	(0.08)
Constant	0.59***	0.11	0.79***	0.54***	0.56***	0.35
	(0.05)	(0.18)	(0.22)	(0.07)	(0.06)	(0.28)
Observations	912	912	912	912	912	912
Number of id	152	152	152	152	152	152
Individual random effects	YES	YES	YES	YES	YES	YES

Source: Authors' elaboration.

Table 63 - Treatment effect on likelihood of getting at least one bonus including covariates, the Netherlands

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	P(get at least one bonus)	P(get at least one bonus)	P(get at least one bonus)	P(get at least one bonus)	P(get at least one bonus)	P(get at least one bonus)
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	0.01	-0.00	0.02	0.00	0.01	-0.00
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	-0.01	-0.03	-0.01	-0.03	-0.02	-0.03
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	0.02	0.03	0.01	0.02	0.02	0.03
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-0.01	-0.00	-0.02	-0.02	-0.02	-0.00
	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system})$	0.04	0.04	0.04	0.04	0.04	0.04
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system})$	0.01	0.01	0.01	0.01	0.01	0.01
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system})$	0.01	0.01	0.01	0.01	0.01	0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}))$	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}))$	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Order		0.01	0.02	0.03	0.02	0.01
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Female		-0.03				-0.03
		(0.03)				(0.03)
Age		0.01**				0.01**
		(0.00)				(0.00)
Married		0.03				0.03
		(0.04)				(0.04)
Partner doctor		-0.01				-0.00
		(0.04)				(0.04)
Years since degree		-0.00				-0.00
		(0.00)				(0.00)
Specialist		0.06				0.05
		(0.06)				(0.05)
Years of experience in the specialty field		-0.16				-0.16
		(0.13)				(0.16)
Years of experience in current job		-0.02				-0.02
		(0.14)				(0.16)
Family doctors		0.06*				0.05*
		(0.03)				(0.03)
Income perception (in-		-0.01				-0.01

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**
group)						
		(0.01)				(0.01)
Income perception (out-group)		0.00				0.00
		(0.01)				(0.01)
Risk aversion			0.02			0.01
			(0.02)			(0.02)
Financial risk aversion			-0.02			-0.02
			(0.02)			(0.02)
Time preference			-0.02			-0.03
			(0.02)			(0.02)
Inequality aversion			0.01			0.01
			(0.02)			(0.02)
Political participation			0.03			0.02
			(0.03)			(0.04)
Reciprocity			-0.00			-0.00
			(0.00)			(0.00)
Altruism			-0.00			-0.00
			(0.00)			(0.00)
Prescribe generic drugs				-0.01		-0.04
				(0.04)		(0.04)
Research generic drugs				0.05		0.04
				(0.03)		(0.03)
Dealing with pharmacists				0.02		-0.00
				(0.03)		(0.03)
Drug name reason to				0.05		0.06*

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**	**P(get at least one bonus)**
prescribe						
				(0.03)		(0.03)
Entrepreneurship experience					-0.04	-0.05
					(0.05)	(0.06)
Entrepreneurship intention					0.06	0.04
					(0.04)	(0.04)
Constant	0.87***	0.65***	0.92***	0.84***	0.86***	0.75***
	(0.04)	(0.10)	(0.12)	(0.05)	(0.04)	(0.16)
Observations	912	912	912	912	912	912
Number of id	152	152	152	152	152	152
Individual random effects	YES	YES	YES	YES	YES	YES

Source: Authors' elaboration.

Table 64 - Treatment effect on likelihood of getting a correct diagnosis including covariates, the Netherlands

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	-0.06	-0.06	-0.05	-0.06	-0.06	-0.04
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	-0.02	-0.02	-0.00	-0.02	-0.02	0.00
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	-0.03	-0.06	-0.03	-0.03	-0.03	-0.06
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-0.06	-0.09*	-0.06	-0.06	-0.06	-0.09*
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system})$	-0.13***	-0.13***	-0.13***	-0.13***	-0.13***	-0.13**
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system})$	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system})$	-0.17***	-0.17***	-0.17***	-0.17***	-0.17***	-0.17***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system} - E(Y_{control}^{health\ system})$	0.04	0.04	0.04	0.04	0.04	0.04
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system} - E(Y_{control}^{health\ system})$	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Order		-0.02	-0.01	-0.02	-0.02	-0.00
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Female		0.01				0.02
		(0.03)				(0.03)
Age		0.00				0.00
		(0.00)				(0.00)
Married		-0.04				-0.03
		(0.04)				(0.04)
Partner doctor		0.01				-0.00
		(0.04)				(0.04)
Years since degree		0.00***				0.00***
		(0.00)				(0.00)
Specialist		-0.08*				-0.08*
		(0.04)				(0.04)
Years of experience in the specialty field		0.02				0.09
		(0.11)				(0.11)
Years of experience in current job		-0.19*				-0.30**
		(0.11)				(0.12)
Family doctors		0.01				0.04
		(0.04)				(0.04)
Income perception (in-		0.02*				0.02*

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**
group)						
		(0.01)				(0.01)
Income perception (out-group)		-0.01				-0.01
		(0.01)				(0.01)
Risk aversion			0.01			0.01
			(0.02)			(0.02)
Financial risk aversion			0.01			0.01
			(0.02)			(0.02)
Time preference			-0.01			0.01
			(0.02)			(0.02)
Inequality aversion			0.03*			0.02
			(0.02)			(0.02)
Political participation			0.04			0.06*
			(0.03)			(0.03)
Reciprocity			-0.00			-0.00
			(0.00)			(0.00)
Altruism			0.00			0.00
			(0.00)			(0.00)
Prescribe generic drugs				0.06*		0.07*
				(0.03)		(0.04)
Research generic drugs				-0.02		-0.03
				(0.03)		(0.03)
Dealing with pharmacists				-0.05*		-0.04
				(0.03)		(0.03)
Drug name				0.00		-0.01

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**	**P(Correct diagnosis)**
reason to prescribe						
				(0.03)		(0.03)
Entrepreneurship experience					-0.01	-0.03
					(0.04)	(0.05)
Entrepreneurship intention					0.01	-0.01
					(0.03)	(0.03)
Constant	0.51***	0.47***	0.34***	0.51***	0.52***	0.23
	(0.04)	(0.10)	(0.12)	(0.05)	(0.04)	(0.15)
Observations	912	912	912	912	912	912
Number of id	152	152	152	152	152	152

Source: Authors' elaboration.

Table 65 Treatment effect on likelihood of getting a correct prescription including covariates, the Netherlands

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ syste}$	0.06	0.04	0.06	0.05	0.06	0.05
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ syste}$	0.02	0.02	0.01	0.00	0.02	-0.00
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-0.07	-0.08*	-0.09*	-0.09**	-0.07	-0.10**
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ syste}$	-0.12**	-0.12**	-0.12**	-0.12**	-0.12**	-0.12**
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ syste}$	-0.24***	-0.24***	-0.24***	-0.24***	-0.24***	-0.24***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ syste}$	-0.22***	-0.22***	-0.22***	-0.22***	-0.22***	-0.22***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ syst} - E(Y_{control}^{health\ syste}$	-0.12*	-0.12*	-0.12*	-0.12*	-0.12*	-0.12*
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ syst} - E(Y_{control}^{health\ syste}$	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Order		0.00	0.01	0.01	0.01	0.01
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Female		-0.04				-0.04
		(0.03)				(0.03)
Age		0.00				0.00
		(0.00)				(0.00)
Married		0.01				0.03
		(0.04)				(0.04)
Partner doctor		0.06*				0.08**
		(0.03)				(0.04)
Years since degree		-0.00				-0.00
		(0.00)				(0.00)
Specialist		-0.01				-0.04
		(0.05)				(0.05)
Years of experience in the specialty field		-0.27***				-0.20***
		(0.06)				(0.08)
Years of experience in current job		0.13				0.09
		(0.08)				(0.09)
Family doctors		0.01				0.02
		(0.03)				(0.04)
Income perception (in-group)		0.00				0.01

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**
		(0.01)				(0.01)
Income perception (out-group)		0.00				-0.01
		(0.01)				(0.01)
Risk aversion			0.02			0.01
			(0.02)			(0.02)
Financial risk aversion			-0.01			-0.01
			(0.02)			(0.02)
Time preference			0.01			0.02
			(0.02)			(0.02)
Inequality aversion			-0.01			0.00
			(0.02)			(0.02)
Political participation			0.03			0.03
			(0.03)			(0.03)
Reciprocity			-0.00*			-0.00**
			(0.00)			(0.00)
Altruism			-0.00			-0.00
			(0.00)			(0.00)
Prescribe generic drugs				0.03		-0.01
				(0.03)		(0.04)
Research generic drugs				0.00		0.01
				(0.03)		(0.03)
Dealing with pharmacists				0.05*		0.05*
				(0.03)		(0.03)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**	**P(Correct prescription)**
Drug name reason to prescribe				0.00		-0.00
				(0.04)		(0.04)
Entrepreneurship experience					-0.01	-0.02
					(0.04)	(0.05)
Entrepreneurship intention					-0.01	-0.04
					(0.04)	(0.04)
Constant	0.42***	0.35***	0.44***	0.37***	0.42***	0.34**
	(0.03)	(0.11)	(0.12)	(0.05)	(0.04)	(0.14)
Observations	912	912	912	912	912	912
Number of id	152	152	152	152	152	152
Individual random effects	YES	YES	YES	YES	YES	YES

Table 66 - Treatment effect on likelihood of prescribing generic drugs including covariates, the Netherlands

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	0.01	0.01	0.01	0.00	0.03	0.03
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	0.06**	0.07**	0.06**	0.06**	0.08***	0.08***
	(0.03)	(0.05)	(0.03)	(0.03)	(0.03)	(0.03)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	0.08	0.07	0.07	0.08	0.08	0.07
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-0.02	-0.02	-0.03	-0.01	-0.02	-0.03
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system})$	0.18***	0.18***	0.18***	0.18***	0.18***	0.18***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system})$	0.23***	0.23***	0.23***	0.23***	0.23***	0.23***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system})$	0.08*	0.08*	0.08*	0.08*	0.08*	0.08*
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system} - E(Y_{control}^{health\ system})$	0.05	0.05	0.05	0.05	0.05	0.05
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system} - E(Y_{control}^{health\ system})$	-0.10*	-0.10	-0.10	-0.10*	-0.10*	-0.10

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Order		0.02	0.00	0.01	0.01	0.02
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Female		-0.02				-0.02
		(0.03)				(0.03)
Age		0.00				0.00
		(0.00)				(0.00)
Married		-0.04				-0.02
		(0.04)				(0.04)
Partner doctor		-0.00				-0.00
		(0.03)				(0.03)
Years since degree		-0.00***				-0.00***
		(0.00)				(0.00)
Specialist		-0.02				-0.04
		(0.04)				(0.05)
Years of experience in the specialty field		0.25***				0.29***
		(0.06)				(0.08)
Years of experience in current job		-0.27***				-0.31***
		(0.07)				(0.09)
Family doctors		0.01				-0.00
		(0.03)				(0.03)
Income perception (in-group)		-0.01				-0.00
		(0.01)				(0.01)
Income perception (out-group)		-0.01				-0.01
		(0.01)				(0.01)
Risk aversion			0.01			0.01

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**
			(0.02)			(0.02)
Financial risk aversion			-0.01			-0.01
			(0.02)			(0.02)
Time preference			0.00			-0.00
			(0.02)			(0.02)
Inequality aversion			0.01			0.02
			(0.02)			(0.02)
Political participation			0.00			-0.00
			(0.03)			(0.03)
Reciprocity			-0.00			-0.00
			(0.00)			(0.00)
Altruism			0.00			0.00
			(0.00)			(0.00)
Prescribe generic drugs				-0.03		-0.00
				(0.03)		(0.04)
Research generic drugs				0.03		0.02
				(0.03)		(0.03)
Dealing with pharmacists				-0.01		0.00
				(0.03)		(0.03)
Drug name reason to prescribe				0.05**		0.05*
				(0.03)		(0.03)
Entrepreneurship experience					-0.08**	-0.10**
					(0.04)	(0.05)
Entrepreneurship intention					0.01	0.00
					(0.03)	(0.03)
Constant	0.72***	0.75***	0.68***	0.72***	0.73***	0.72***

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**	**P(prescribe generic drugs)**
	(0.04)	(0.10)	(0.10)	(0.04)	(0.04)	(0.13)
Observations	912	912	912	912	912	912
Number of id	152	152	152	152	152	152
Individual random effects	YES	YES	YES	YES	YES	YES

Table 67 - Treatment effect on likelihood of following doctor's prescription including covariates, the Netherlands

	(1)	(2)	(3)	(4)
VARIABLES	**P(following doctor prescription)**	**P(following doctor prescription)**	**P(following doctor prescription)**	**P(following doctor prescription)**
$E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system})$	0.11*	0.11*	0.12**	0.13**
	(0.06)	(0.06)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{control}^{private})$	0.09	0.09*	0.10*	0.11**
	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system})$	0.02	0.02	0.02	0.02
	(0.06)	(0.06)	(0.05)	(0.06)
$E(Y_{peer}^{private}) - E(Y_{control}^{private})$	-0.01	-0.00	-0.01	-0.00
	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{control}^{private}) - E(Y_{control}^{health\ system})$	-0.01	-0.01	-0.01	-0.01
	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{market}^{health\ system})$	-0.03	-0.03	-0.03	-0.03
	(0.04)	(0.04)	(0.04)	(0.04)
$E(Y_{peer}^{private}) - E(Y_{peer}^{health\ system})$	-0.04	-0.04	-0.04	-0.04
	(0.05)	(0.05)	(0.05)	(0.05)
$E(Y_{market}^{private}) - E(Y_{control}^{private}) - (E(Y_{market}^{health\ system}) - E(Y_{control}^{health\ system}))$	-0.02	-0.02	-0.02	-0.02
	(0.07)	(0.07)	(0.07)	(0.07)
$E(Y_{peer}^{private}) - E(Y_{control}^{private}) - (E(Y_{peer}^{health\ system}) - E(Y_{control}^{health\ system}))$	-0.03	-0.03	-0.03	-0.03
	(0.07)	(0.07)	(0.07)	(0.07)
Order		0.02	0.03	0.03

	(1)	(2)	(3)	(4)
VARIABLES	**P(following doctor prescription)**	**P(following doctor prescription)**	**P(following doctor prescription)**	**P(following doctor prescription)**
		(0.04)	(0.04)	(0.03)
Female		0.00		-0.00
		(0.04)		(0.04)
Age		-0.00		-0.00
		(0.00)		(0.00)
Married		-0.02		0.00
		(0.05)		(0.05)
Risk aversion			-0.03*	-0.04**
			(0.02)	(0.02)
Financial risk aversion			-0.00	0.00
			(0.02)	(0.02)
Time preference			0.03	0.03
			(0.02)	(0.02)
Inequality aversion			0.03**	0.04**
			(0.02)	(0.02)
Political participation			0.01	0.01
			(0.04)	(0.04)
Reciprocity			0.00	0.00*
			(0.00)	(0.00)
Altruism			-0.00	-0.00
			(0.00)	(0.00)
Constant	0.69***	0.73***	0.50***	0.58***
	(0.04)	(0.07)	(0.14)	(0.15)
Observations	912	912	912	912
Number of id	152	152	152	152
Individual random effects	YES	YES	YES	YES

Source: Authors' elaboration.

The full regression model for the full sample, including the covariates

Table 68 - Main effect in outcome variables and differences between countries including covariates

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**Time spent in solving the case (in seconds)**	**P(get high bonus)**	**P(get low bonus)**	**P(Correct diagnosis)**	**P(Correct prescription)**	**P(prescribe generic drugs)**
$E(Y_{market}) - E(Y_{control})$	6.54	-0.05	-0.02	-0.01	0.05*	0.04**
	(8.00)	(0.04)	(0.03)	(0.03)	(0.03)	(0.02)
$E(Y_{peer}) - E(Y_{control})$	-8.12	0.01	0.01	-0.06**	-0.02	0.01
	(6.81)	(0.04)	(0.03)	(0.03)	(0.03)	(0.02)
$E(Y^{private}) - E(Y^{health\ system})$	-16.02***	0.09***	0.02*	-0.09***	-0.09***	0.08***
	(3.51)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)
$E(Y_{Netherlands}) - E(Y_{Spain})$	23.90**	-0.15**	-0.01	-0.14***	-0.15***	-0.04
	(9.77)	(0.07)	(0.03)	(0.04)	(0.04)	(0.03)
Order	-7.58	0.05	0.01	-0.02	-0.00	0.01
	(5.94)	(0.04)	(0.02)	(0.02)	(0.02)	(0.02)
Female	7.30	-0.05	-0.04*	0.02	-0.02	0.03
	(5.79)	(0.04)	(0.02)	(0.02)	(0.02)	(0.02)
Age	0.46	0.00	-0.00	-0.00	0.00	0.00
	(0.73)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Married	-13.35*	0.07	0.01	0.01	0.02	-0.01
	(7.84)	(0.04)	(0.02)	(0.03)	(0.03)	(0.02)
Partner doctor	-3.36	0.01	-0.00	-0.00	0.02	0.00
	(6.83)	(0.04)	(0.02)	(0.03)	(0.03)	(0.02)
Years since degree	0.48**	-0.00	-0.00	0.00**	-0.00	-0.00***
	(0.23)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Specialist	-21.96**	0.12	0.06	-0.05	0.00	-0.02
	(10.84)	(0.07)	(0.05)	(0.04)	(0.04)	(0.04)
Years of experience in the specialty field	-11.39	0.02	0.01	-0.01	-0.11	0.05

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**Time spent in solving the case (in seconds)**	**P(get high bonus)**	**P(get low bonus)**	**P(Correct diagnosis)**	**P(Correct prescription)**	**P(prescrib e generic drugs)**
	(17.54)	(0.10)	(0.06)	(0.07)	(0.08)	(0.06)
Years of experience in current job	18.28	-0.16**	-0.01	-0.07	-0.01	-0.04
	(15.35)	(0.07)	(0.05)	(0.06)	(0.07)	(0.04)
Family doctors	-13.16**	0.07*	0.04**	0.02	-0.03	-0.01
	(6.34)	(0.04)	(0.02)	(0.03)	(0.03)	(0.02)
Income perception (in-group)	0.08	0.00	-0.00	0.00	0.00	0.00
	(1.95)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Income perception (out-group)	-1.36	0.01	0.00	-0.01	0.00	-0.01*
	(2.17)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Risk aversion	-6.04	0.03	0.02	0.01	-0.02	-0.01
	(3.79)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Financial risk aversion	6.15*	-0.02	-0.01	0.00	0.01	-0.01
	(3.18)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Time preference	5.55	-0.04**	-0.00	0.02	0.00	-0.01
	(3.44)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Inequality aversion	-2.10	0.03	-0.00	0.01	0.00	-0.00
	(3.30)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)
Political participation	1.74	0.02	0.02	0.05*	0.00	0.01
	(6.47)	(0.04)	(0.02)	(0.03)	(0.02)	(0.02)
Reciprocity	0.63	-0.00	-0.00	0.00	-0.00	-0.00
	(0.41)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Altruism	0.07	-0.00	-0.00	0.00	0.00	-0.00
	(0.22)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Prescribe generic drugs	-7.49	0.02	-0.00	0.08***	0.03	0.02
	(10.18)	(0.05)	(0.03)	(0.03)	(0.03)	(0.03)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**Time spent in solving the case (in seconds)**	**P(get high bonus)**	**P(get low bonus)**	**P(Correct diagnosis)**	**P(Correct prescription)**	**P(prescribe generic drugs)**
Research generic drugs	-6.38	0.04	0.04	-0.08***	-0.07**	0.02
	(6.52)	(0.04)	(0.02)	(0.03)	(0.03)	(0.02)
Dealing with pharmacists	1.68	-0.01	0.00	-0.03	0.03	0.01
	(7.02)	(0.04)	(0.02)	(0.03)	(0.02)	(0.02)
Drug name reason to prescribe	-14.79**	0.08**	0.06***	0.01	0.00	0.02
	(6.29)	(0.04)	(0.02)	(0.03)	(0.03)	(0.02)
Entrepreneurship experience	7.15	-0.06	-0.05*	0.01	-0.02	-0.03
	(9.23)	(0.05)	(0.03)	(0.03)	(0.03)	(0.02)
Entrepreneurship intention	-12.07	0.03	0.05**	-0.01	-0.01	0.04**
	(7.82)	(0.05)	(0.03)	(0.03)	(0.03)	(0.02)
Constant	102.48***	0.57***	0.85***	0.52***	0.51***	0.91***
	(31.38)	(0.20)	(0.11)	(0.10)	(0.11)	(0.09)
Observations	1,812	1,812	1,812	1,812	1,812	1,812
Number of id	302	302	302	302	302	302
Individual random effects	YES	YES	YES	YES	YES	YES

ANNEX 5: REFERENCES

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