

hospital
innovation
economics

2019-2020 ACTIVITY REPORT



CHAIRE

ASSISTANCE
PUBLIQUE



HÔPITAUX
DE PARIS



PARIS SCHOOL OF ECONOMICS
ÉCOLE D'ÉCONOMIE DE PARIS

Hospinnomics
Hospital - Innovation - Economics

THE HOSPINNOMICS CHAIR

Hospinnomics (Hospital / Innovation / Economics) is a research chair in health economics, the purpose of which is to build a bridge between academic research and the needs for methods or results for public health actors, so that decision-making is based on scientific assessments.

Hospinnomics was created in 2014, following the joint decision of the Chief Executive Officer of the Greater Paris University Hospitals (GPUH), Martin Hirsch, and the Director of PSE at the time, Pierre-Yves Geoffard. In mid-2017, it was renewed for five years.

The Chair has a dual objective. The first step is to develop academic research that may have an impact on decision-making. Secondly, it aims to contribute, within the GPUH, to decisions based on scientific evaluations. The central project is to develop an international research center in economics which relies both on the professional excellence of the GPUH and on the scientific network of PSE. The governance of the chair consists of a steering committee and an international scientific council.

Hospinnomics focuses on innovation, which is one of the most important determinants of growth in health care spending. The cost of adopting innovation is often underestimated because innovation brings hope to patients and therefore benefits from a systematic optimism bias.

Its added value must, however, be assessed from both an individual and collective point of view, in a transparent and robust manner in order to document funding and support decisions. This approach rests with the evaluation of public policies, which are still underdeveloped in the health sector, particularly in France.

Hospinnomics promotes the application of models from various fields of economics to innovation issues in the healthcare sector: industrial economics, behavioral economics, labor economics and public economics. Two dimensions are taken into account. The first concerns organisational innovation, either in the production function (such as hospital mergers, delegation of tasks, integrated care channels), or in financing (optimal payment systems for hospitals and primary care). The second dimension concerns technological innovation, where comparative assessments are made between new technology (drugs, medical devices, procedures) and the care strategy it is meant to replace.

These goals can only be achieved with a dedicated team. The permanent team is made up of management, post-docs, research assistants and doctoral students. It cannot rely solely on permanent senior researchers. On the other hand, the chair can count on the active involvement of its affiliated researchers and doctoral students who are sometimes funded by the chair.



The Greater Paris University Hospitals is the first internationally recognized university hospital center in Europe. Its 39 hospitals welcome more than 8.3 million sick people every year: in consultation, in emergency, during scheduled hospitalizations or in hospitalization at home. Patients benefit from advances in research and participate, if they wish and under the control of an ethics committee, in clinical trials or therapeutic trials. GPUH contributes to the training of a large number of health workers and personnel.

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PARIS SCHOOL OF ECONOMICS
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PSE – Paris School of Economics develops and disseminates, at the highest international level, research in economics. With a community of nearly 140 researchers and 200 doctoral students, it offers teaching at the cutting edge of the economic discipline. PSE brings together universities and grandes écoles, fosters exchanges between economic analysis and other social sciences, places research in society, and supports the work of its teams on multiple partnerships concluded with public institutions or private organizations.

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This year 2019-2020, like previous years, has been exciting and very productive. Hospinnomics continues to build on the 2014 science project, but **new collaborations and the acquisition of research projects have deeply enriched the science program**. The Hospinnomics Chair is faithful to its choice of relying only on public funding to avoid conflicts of interest. Thus, the chair team was able to continue to interact with decision-makers at national and international levels on health care reforms.

Hospinnomics' research and other activities (seminars, workshops, training, etc.) continued to bridge the gap between academic research and decision-making in health and healthcare.

Some of the academic research projects are in fact **directly inspired by the concerns of stakeholders, whether at the national or hospital level**, such as experiments with innovative payment systems or **policy-oriented research**; while some of Hospinnomics' academic research has directly contributed to the design of regulatory policies, such as drug pricing or the reform of hospital funding (**evidence-based policy**).

This work contributes to the progress of health economics, **either by improving health technology assessments** with tools from experimental economics, such as "discrete choice experiments" (DCE), **or by using project rich data and advanced econometric techniques**, to study, for example, lifestyle choices or prevention attitudes. Since its creation, Hospinnomics has always interacted with medical and social sciences (philosophy, sociology, psychology). The chair has also actively engaged with policy makers, government, and the general public in order to maximize the impact of the research conducted.

The research addresses important questions for health policy, for example: How far can we reduce the number of homogeneous patient groups (DRGs) before losing all incentive power? Can group purchasing of medicines reduce prices? How should we reform the out-of-pocket expenses of hospitals in France? What role do peers, whether they provide financial or non-financial incentives (nudges) play in the use of prevention...?



Lise Rochaix

Scientific manager of the chair, professor at PSE and at the University of Paris 1 Panthéon-Sorbonne.

Hospinnomics relies on public research funding, and an endowment from GPUH. In 2019-2020, funding was obtained for **seven new French and European projects** (PREPS RESISTE, PREPS OPTIM- BHRE, EU H2020 CBIG-SCREEN, RHU BOOSTER, SEQOGEN, OPTISARC, CNAM). On average, the Chair responds to 5 to 10 calls for projects per year.

Some major projects, such as PRDVEL, (assessing the impact of online appointment booking on improving service delivery and accessibility of care at GPUH), are now complete. During this period, **eleven articles were published in peer-reviewed and professional journals**, on a wide range of topics.

The cohesion of the team is essential at Hospinnomics. The chair is made up of a small team, works with motivated young researchers including doctoral students, and can rely on the collaboration of senior researchers in France and abroad. Foreign visitors (Audrey Laporte, James Robinson) provided an opportunity for fruitful scientific exchanges.

IN BRIEF

1

The year 2019-2020 sees the confirmation of the research axes validated by the Scientific Council of the chair, with a reinforced use of experimental economics methods for the revelation of preferences and the development of the evaluation of innovation, both financial (new pricing methods) and organizational. Several publications in academic journals confirm the scientific legitimacy of Hospinnomics.

2

Hospinnomics had been analysing topics related to equity, such as online booking or out-of-pocket expenses, which gained visibility as a result of the COVID-19 pandemic. The evaluation of the "Online appointment booking" system developed at GHUP with Doctolib was the subject of media coverage, showing the value of a service offering focused on patient needs.

3

After two theses defended in previous years, two doctoral theses in economics conducted at Hospinnomics were defended at PSE in July 2019; two defenses are expected in 2021 and two new doctoral students joined the Chair at the end of 2020.

4

Participation in several public bodies (Evaluation of major public investment projects, Strategic Council for Health Innovation, France Strategy Expert Committee, etc.) shows growing interest in the contributions of economics to public decision-making in health.

THE HOSPINNOMICS MODEL



CONTENTS

Summary	p.4
Governance	p.5
Team and Affiliates	p.6
Teaching	p.7
Research and Expertise	p.9
Events	p.15
Publications	p.16



GOVERNANCE

The governance of the chair consists of a steering committee with members of the two partner institutions (GPUH and PSE) and a Scientific Advisory Board (SAB).

MEMBERS OF THE STEERING COMMITTEE

The members of the steering committee are: **François Crémieux**, **Florence Favrel Feuillade**, **Jean-Olivier Hairault**, **Martin Hirsch**, **Jérôme Marchand-Arvier**, **Marie Philipon**, **Yazdan Yazdanpanah**.

MEMBERS OF THE SCIENTIFIC ADVISORY BOARD

The Scientific Advisory Board monitors progress according to two dynamic indicators: the added value provided to health actors by academic research projects and the added value provided to university researchers by the expertise of stakeholders.

Chaired for 3 years by Professor **Pierre Corvol** (Collège de France), the SAB is now chaired by Professor **Yazdan Yazdanpanah** (GPUH).

It is composed of:

Robert Elliot: Labor Economics, Aberdeen University – United Kingdom

Randall Ellis: Industrial Economics, Boston University – USA

Sherry Glied: Health Economics, Columbia University – USA

Alberto Holly: Econometrics, Lausanne University – Switzerland

Audrey Laporte: Health Economics, University of Toronto – Canada

Pedro Pita Barros: Industrial Economics, University Nova de Lisboa – Portugal

Carol Propper: Public Economics, Imperial College London – United Kingdom



TEAM AND AFFILIATES

THE PERMANENT TEAM

Lise Rochaix has been the Scientific Director of the Hospinnomics Chair since its creation. **Jean-Claude K. Dupont** has been its deputy director since 2015. In 2017, **Christine Meyer** joined the permanent team to work on reform of out-of-pocket expenses or innovative payment systems, as well as to help with valuation of the activities and productions of Hospinnomics.

The 2019-2020 team includes **Emelie Lindström**, who joined the team in June 2019 as project manager on the IMPACT-HTA project and **Thomas Pelloquin** (Paris 1) who started as project manager in December 2019. Several master's graduates have also recently joined the team as research assistants: **Faustine Emmanuel**, **Thelma Arcelin** and **Lucie Sabin**.

Also contributing to the work of the chair this year: **Rolando Leiva** on Impact-HTA and on emergencies until December 2019; **Lorène Jacoud** as part-time research assistant until December 2019 on the CRISTAL-IMAGE project; **Caroline Ras** on the ROSIE project from January to July 2020.

AFFILIATED RESEARCHERS

The team has grown over the years with the affiliation of senior researchers to the chair. Some of these affiliate researchers have spent time at Hospinnomics, while others work closely with the team on certain projects. **James Robinson's** sabbatical from UC Berkeley scheduled for fall 2020 had to be postponed due to COVID-19 restrictions.

The Affiliated Researchers are : Bénédicte Apouey (CNRS/PSE), Marc Bardou (CHUDijon Bourgogne), Eliana Barrenho (OECD), Luc Baumstark (Commissariat Général à l'Investissement), Pauline Chauvin (LIRAES), Valérie Clément (Université de Montpellier), Benoit Dervaux (CHU Lille), Paul Dourgnon (IRDES), Fabrice Etilé (PSE), Mattéo Galizzi (LSE), Philippe Gorry (Université de Bordeaux), Laurence Hartmann (CNAM), Hélène Huber (Université Paris 1/PSE), Izabela Jelovac (CNRS), Jean-Michel Josselin (Université Rennes 1), Audrey Laporte de l'Université de Toronto, Christine Le Clainche (Université de Lille), Rolando Leiva (UCL), Antoine Marsaudon (IRDES), Grégoire Mercier (Université de Montpellier), Marisa Miraldo (Imperial College Business School, London), Antoine Nebout (INRA), Grégory Ninot (Université de Montpellier), Zeynep Or (IRDES), Erwann Paul (CHU de Caen), Lionel Perrier (Centre Léon Bérard), Thomas G. Poder (Université de Montréal), Thomas Rapp (LIRAES), Silvana Robone (Université d'Insubria), Valérie Seror (VITROME - IRD), Vandana Sharma (Harvard T.H. Chan School of Public Health), Jonathan Sicsic (LIRAES), Sandy Tubeuf (Université Catholique de Louvain).



TEACHING

The chair is committed to the training of young post-doctoral researchers, doctoral students and masters. Courses are also provided by the permanent team.

POST-DOCTORATES

Antoine Marsaudon completed his 10-month postdoctoral contract in February 2020, he is now a researcher at the Institute for Research and Documentation in Health Economics (IRDES, Paris). **Setti Raïs** completed her 10-month postdoctoral fellowship in April 2020, funded by the Imagine Institute.

DOCTORATES

DEFENDED THESES

Antoine Marsaudon defended his thesis in behavioral economics applied to health at the Paris School of Economics on July 1, 2019. The title of his thesis is "Impact of Health Shocks on Personality Traits, Economic Preferences, and Risky Behaviors" .

Setti Raïs defended her thesis on July 3, 2019 on the impact of public policies on diagnostic and therapeutic times for patients with rare diseases. The title of her thesis is "Diagnostic and therapeutic odyssey: essays in health economics".

THESES IN PROGRESS

Aleksandr Proshin, in his fourth year, is working on the improvement of Homogeneous Groups of Patients (DRG), in particular for cesarean section, thanks to a grant from the doctoral school of the Paris School of Economics. Management: Lise Rochaix and Audrey Laporte (University of Toronto).

Ivan Tzintzun, in his fourth year, is working on behavioral economics, specifically related to obesity. The subject of his thesis is "Social Networks, Time Preferences and Market Failures: Three Essays on Health Economics". Management: Lise Rochaix and Marc-Arthur Diaye (University of Paris 1). He obtained a thesis grant from the Mexican government.

Marc-Antoine Sanchez started his doctoral program in 2017 under the joint supervision of Thomas Barnay (UPEC) and Lise Rochaix.

MASTERS AND INTERNSHIPS

Several students have completed internships at Hospinnomics, some of which have been the subject of a master's thesis:

- **Thelma Arcelin** (European Master's degree in health economics and management, University of Bologna) on the impact of unemployment on health and health behavior (6-month internship in 2020).
 - **Suzanne Anglivièl** (Master APE, PSE) on the impact of unemployment on health and health behavior in Russia (from November 2018 for a period of 8 months).
 - **Sarah Nedjar** (Master APE, PSE) on the relationship between primary care and admissions to emergency departments (6-month internship in 2020).
 - **Olivier Supplisson** (HEC Paris) on the EQUI-RAC project (2-month internship in 2018 then a 6-month internship in 2020).
 - **Jeesoo Lee** (Master's in International Business Management, Paris 1) on the use of electronic methods for collecting patient self-reported health results (ePRO) in pediatric oncology (6-month internship).
- Three interns were hosted at Hospinnomics, without this giving rise to the writing of a thesis:
- **Maria José Gonzalès** (Master APE, PSE) (2 months in summer 2020).
 - **Mickaël Sixdenier** (Master APE, PSE) (3 months in summer 2020).
 - **Solène Blanc** (Master APE, PSE) (3 months in summer 2020).

MOOC

One of the most obvious ways to connect with the general public is to produce a Massive Open Online Course (MOOC). Hospinnomics created the first MOOC in health economics in French and it was broadcast on the FUN platform (France Université Numérique). Classes took place between June 4 and July 31, 2018, with 3,995 people enrolled. This MOOC is now available on the chair's website and Youtube channel.

TEACHING

Lise Rochaix (2019-2020). Teaching as part of the economics department at the University of Paris 1 Panthéon-Sorbonne.

Lise Rochaix (2020). "Global Health Economics". M1 Sciences Po, Paris.

Lise Rochaix (16 septembre 2019). "Health Systems Reform". IHF, Paris. Lise Rochaix (9 septembre 2019). EN3S, Paris.

Jean-Claude K. Dupont. Supervision of master's theses in ethics. Paris Descartes, EA ETREs.

Jean-Claude K. Dupont. Responsible for a teaching unit in "ethics and economics", Master of ethics, M2 level, Paris Descartes, EA ETREs.

Jean-Claude K. Dupont. Lecturer in professional license in management of health establishments, "knowledge of medicine" and "health ethics", IUT Paris Descartes.

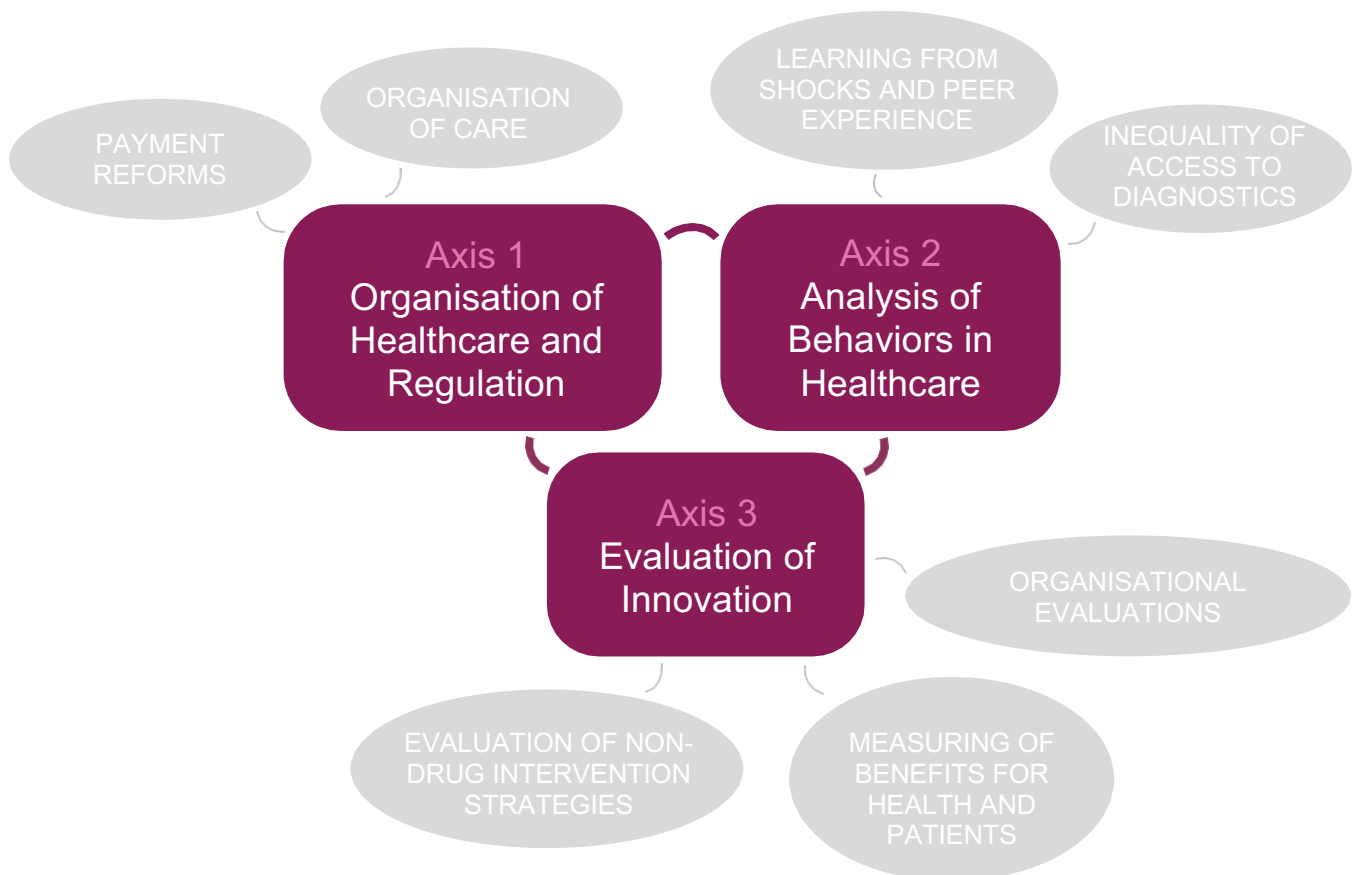


RESEARCH AND EXPERTISE

The research and expertise results are presented jointly for the **three main lines of research at Hospinnomics**. The objective of the chair is to promote convergence between scientific production and expertise. Effectively:

- Part of the expertise initially requested by GPUH may give rise to requests for research funding, leading to a joint production of expertise and scientific research. These public research projects enrich GPUH's skills in human and social sciences, beyond economics.
- Conversely, some of the research questions initially developed by Hospinnomics researchers can lead to the production of expertise (literature reviews, data analyzes, policy-briefs), for GPUH teams or more broadly, health policy makers.

AXES AND ASSOCIATED THEMES



Axis 1 – Organisation and Regulation of Healthcare

This first line of research focuses on the analysis of the organizational characteristics of health systems by studying the impact of regulatory changes or reforms on the efficiency, equity or quality of services. Several themes have been developed.

PUBLIC-PRIVATE COMPETITION

Daniel Herrera and Lise Rochaix have studied the **mechanisms of competition between public and private maternity hospitals**, where user preferences play a strong role. The findings confirm the importance of the degree of competition between private maternities but also with public maternities. The results also show that the latter only crowd out private maternity hospitals when the market is large enough. No crowding out effect is observed from the private sector to the public sector (Herrera-Araujo and Rochaix 2020a).

REGULATION OF ORPHAN DRUGS

This **research on the development of orphan drugs for rare diseases** was developed as part of a research project on rare cancers funded by the National Cancer Institute (INCA) and developed in collaboration with the University of Bordeaux and Imperial College (London). Two academic articles are in the process of being published. A partnership with the Imagine Institute has also made it possible to finance a 1st thesis grant (Setti Raïs), a 2nd being expected for the start of the 2021 school year.

DRUG PRICING AND REIMBURSEMENT

Following the work carried out on drug pricing and reimbursement schemes, Laurie Rachet-Jacquet, Léa Toulemon and Lise Rochaix studied **the impact of the removal of expensive drugs for cancer from the “add-on list” through four waves of delisting**. The results suggest that prescription volumes, product choices (principles versus generic form) and price levels are not systematically affected by these withdrawals, regardless of the type of hospital (Rachet-Jacquet et al. P. D.).

Lise Rochaix at Hospinnomics is studying **accelerated drug marketing procedures** with LSE. These raise concerns about the ability to assess the real-life medical efficacy of these innovations and their added value from a community perspective. In an article published by The Lancet, 5 key principles are proposed to encourage pharmaceutical companies to produce comparative data on medicines and to ensure that the data necessary for decision-making are available. (Naci et al. 2020).

PAYMENT REFORM: OPTIMAL NETWORK PRICING

Hospinnomics is part of a Consortium (Center Léon Bérard, Ecole Nationale Supérieure des Mines, Center for Processing and Analysis of Data in Pharmacoepidemiology) and is in charge, with Lionel Perrier within the framework of the "OPTISARC" project, of **analyzing incentives to encourage the performance of surgical operations in specialized centers, on the basis of an early diagnosis**.

EMERGENCY DEPARTMENTS

Sarah Nedjar has shown that the **financial incentives offered to general practitioners to move to areas with less resources are associated with a 5% reduction on emergency department admissions** (Nedjar 2020). An original database was built at Hospinnomics from the Summaries of Emergency Visits (RPU) and is available for 4 regions between 2010 and 2015, with links to other databases at the local level regarding primary care and patient demographics in the hospital service area. By using the "Territory Health Pact" as a treatment for the eligible municipalities, the construction of this unique data set is a major asset for the future work of Hospinnomics in this field.

REFORM OF HOSPITAL EXPENSES

Hospinnomics participates in a research consortium jointly with two other research teams (IRDES and ECEVE, INSERM UMR1123). **The chair is in charge of WP3, which tests new reform proposals**, such as the elimination of copayment billing in the context of hospital care. The philosophical, legal and political foundations of these reforms will also be analyzed in this context so that the conclusions of the EQUIRAC project are relevant and have scientific value for decision-makers.

PAYMENT REFORM: EPISODE-BASED PAYMENT

Hospinnomics is part of a Consortium led by Nicolas Sirven (EHESP) for the **evaluation of French experiments under Article 51 on episode-of-care payments**. The other partners are Sciences Po, the Ecole des Hautes Etudes en Santé Publique (EHESP), and the Paris School of Economics (PSE). A five-year contract has been signed with the CNAM. The objective is to build a multidisciplinary evaluation of the experimental financing system implemented for surgical procedures in 46 voluntary hospital sites that meet the specifications.

PAYMENT REFORM: PAYING FOR QUALITY

A Franco-Ontarian project funded by the CNRS made it possible to **develop comparisons of hospital care financing reforms**. The simulation models are based on the most recent econometric and machine learning techniques applied to longitudinal administrative datasets which are anonymized at the patient level. An article written by Aleksandr Proshin as part of his thesis examines these "quality-based procedures" and their impact on the volume and quality of orthopedic care in Ontario hospitals. Conversely, Adrian Rohit, as part of his doctorate at the University of Toronto, under the supervision of Audrey Laporte, uses French data from the Technical Agency for Information on Hospitalization to simulate the impact of the implementation of the Ontario system in France.

Lise Rochaix and her co-authors at HAS have documented the issues of **defining and measuring quality and the relevance of setting up quality-based payments** in France as part of a special issue of Journal de Gestion and of Health economics on this theme, following a conference organized on September 27, 2019. The study analyzes the prospects for the adoption of quality-based payments within the framework of the funding reform projects announced in France, by the government.

Axis 2 – Analysis of Behaviors in Health

This second line of research focuses on the analysis of behavioral determinants of lifestyle choices, access to screening, diagnosis or treatment.

IMPACT OF HEALTH SHOCKS

The first set of work is based on econometric methods centered on the analysis of the impact of health shocks on variables such as risk tolerance (Marsaudon, Galizzi and Machado, 2020) or locus of control (Marsaudon 2019). Regarding lifestyles, the results do not indicate an effect on the body mass index (BMI), but a significant reduction in the consumption of tobacco and alcohol, with heterogeneous effects. Heavy smokers were more likely reduce their tobacco consumption than occasional smokers, (Marsaudon and Rochaix 2019a). This work is being continued within the framework of the BeHealth Consortium funded by the ANR. The relationship between health shocks (road accidents) and professional trajectories was also analyzed on the Gazel cohort (EDF-GDF) (Sanchez et al. 2019).

Additional work was carried out to study the reverse causal link, which ranges from employment to health status and health behaviors with two M2 theses on Russian (Angliviél 2019) and French (Constances Cohort) data (Arcelin 2020). Results show that unemployment dramatically degrades health, with increased smoking and alcohol consumption, while reducing the effectiveness of preventive medical care.

INDIVIDUAL PREFERENCES AND ACCESS TO CARE

The DOD-Ks project, funded by IRESP and led by Christine Le Clainche and Lise Rochaix with Antoine Marsaudon, studies the role played by personality traits (extraversion, sociability) and individual preferences (with regard to time and risk) in explaining delays in obtaining a breast cancer diagnosis. Econometric analyses show, for example, a statistically significant inverse relationship between delayed diagnosis and being a "reserved" person. The relationship with preferences varies with the indicator used.

Hospinnomics is a member of the RESISTE Consortium headed by Marc Bardou (CHU Dijon) which aims to assess the effectiveness, ethical and economic issues, and the distribution of benefits of an incentive intervention aimed at encouraging cervical cancer screening in socially disadvantaged women. The study mobilizes discrete choice experiments to measure the revealed preferences of patients and professionals regarding self-testing and the establishment of financial incentives for patients. A consortium (CBIG-SCREEN) funded by the EU is helping to develop a similar project on a European scale.

Axis 3 – Evaluation of innovation

This third axis is at the heart of Hospinnomics' activity and is broken down into three subjects: measurement of benefits, evaluation of therapeutic strategies, and evaluation of organizational innovation.

MEASUREMENT OF HEALTH BENEFITS

Moving from just measuring costs to comparing them with benefits broadens the evaluative perspective in order to anchor the system's priorities in the patient / user perspective. This is the point of view adopted to enlighten the decision-maker on the definition of the priorities and rules of access to health services.

Daniel Herrera and Lise Rochaix conducted an empirical assessment of the effects of age and health on the propensity to accept compensation for an increased risk of mortality. This was done by reporting the results of a wage differential compensating for the risk of mortality linked to professional status in France. The results show in particular that the relationship between age and statistical life value is U-shaped (Herrera-Araujo and Rochaix 2020b).

When measuring and evaluating health benefits, the patient and public perspective is essential. In recent years, Patient and Public Engagement (PPP) has increasingly been viewed as a valuable resource. The objectives are to promote health democracy, but also to guarantee the social acceptability of health interventions. The topic of value-based healthcare is of interest to GPUH and collecting self-reported patient data is the very first step towards valuing healthcare from a patient perspective.

EVALUATION OF THERAPEUTIC STRATEGIES

Hospinnomics participates in the European IMPACT-HTA project, with Panos Kanavos (LSE) as the principal investigator. The general objective of this project is to propose methods, recommendations, and tools for decision-makers, in ten research areas of health technology assessment (HTA) and health systems performance measurement. Responsible for a workpackage, the chair designed in 2020 an online discrete choice experiment (DCE) focusing on stakeholders' preferences and their willingness to accept 'decrementally cost-effective' type interventions (including non-drug interventions), implying a slight loss clinical efficacy and significant cost reductions. A toolkit that outlines the risks and associated trade-offs will be provided to guide policy makers in their decisions to replace usual care with these strategies.

In addition, work has been carried out on the economic valuation of non-drug interventions (INM). Measuring the benefits of INMs is quite complex in economic evaluation, as the clinical evidence is often insufficient or of low value. Yet policymakers are increasingly asking to measure the value of non-drug strategies, as useful adjuncts to drug therapies.

Ivan Tzintzun and Lise Rochaix explore the effect of physical activity on the perception of health status and the number of noncommunicable diseases in early adulthood. The results suggest that leisure-related physical activity has a significant positive effect on health and reduces the number of chronic diseases. In addition, intense physical activity related to work has the opposite effect: it decreases the perceived state of health and increases the risk of chronic diseases.

EVALUATION OF ORGANISATIONAL INNOVATION

The EVALCASE project was commissioned by the Caisse Nationale d'Assurance Maladie to assess the impact of case-management of serious occupational accidents on their incapacity for work, as well as on treatment costs. The evaluation shows that the program resulted in an increase in temporary and permanent work incapacity scores, as well as an increase in treatment costs in the first year. An article is being edited for the Journal of Occupational Rehabilitation (Kiefer et al. P. D.).

Hospinnomics was commissioned to assess the impact of a new **online appointment booking system on Doctolib** for outpatient clinics on GPUH's business. The final evaluation made in the fall of 2020 shows that the online appointment service leads to an increase in activity, a decrease in the no-show rate, and an increase in the time to the first appointment.

The PIC-R project (PRME program), led by Lise Rochaix and Evangéline Pillebout, nephrologist at , aims to assess, for kidney disease in hospitals, the benefits of therapeutic education when an interactive and community-based internet platform is used. The first patients reached the end of the observation period in the first half of 2020.

The AMBU-ENDO program, led by Lise Rochaix and GPUH clinician Geoffroy Canlorbe, aims to assess the cost-effectiveness of outpatient surgery versus full hospitalization for endometrial cancer. This project will also provide valuable knowledge on two strategies for assessing health benefits (in terms of QALY and well-being) and on the preferences of patients and professionals regarding the main characteristics of endometrial cancer management.

The ROSIE project was initiated by a network of public and private gerontology centers in the Paris region (GEROND'IF), led by GPUH. The goal is to map and describe the use of social robots in geriatrics. In cooperation with Benoit Dervaux (CHU Lille), Hospinnomics offers advice on adapting the standards of economic evaluation methods to the particularities of these medical devices, to the health needs of institutionalized elderly people, and to the specificities of their care environments.

The CRISTAL IMAGE project, under the responsibility of Isabelle Durand-Zaleski (URC-Eco), is a telehealth project set up by the Biomedicine Agency (ABM), in charge of organ allocation. CRISTAL is a remote information system that provides real-time visualization of the characteristics and imaging of donor organs so that transplant teams can decide to initiate the transplant. Hospinnomics is responsible for incorporating a preference elicitation study into this project to determine the willingness of transplant professionals to adopt this system.

The SEQOGEN project consists of a global economic evaluation of two very high throughput sequencing platforms for diagnostic purposes (SeqOIA and AURAGEN). These platforms were selected by the Ministry of Solidarity and Health as part of the call for projects for the implementation and evaluation of pilot projects of very high throughput sequencing platforms for diagnostic purposes of the France Medicine Genomic Plan 2025 (PFMG).



EVENTS

ANNUAL TECHNICAL WORKSHOPS

The annual technical workshops organized by Hospinnomics are very popular because they provide the opportunity to interact with researchers, professionals, in particular from the GPUH, and public policy partners. In 2019-2020, the technical workshops focused on the regulation of medicines (2019) and on the risk adjustment of payment methods (2020).

- In the fourth quarter of 2019, the technical workshop on the regulation of drugs and medical devices concluded: James Robinson (University of Berkeley) held the session on December 17, 2019 on the comparison of regulations for biosimilars between the United States, Germany and France. It followed the sessions organized with Thomas Rapp from the University of Paris (LIRAES), on drug regulation (February 11, 2019), Jaime Caro (LSE) on DICE models and their applications, and with Frank Lichtenberg (Columbia University) on the regulation of drug prices (July 3, 2019).
- In 2020, the technical workshop on hospital payment reforms was devoted to risk adjustment. Six presentations were given by researchers or representatives of French administrations. The first concerned the modeling of national health expenditure, presented by Panayotis Constantinou. Nathalie Rigollot, ATIH statistician, made the second presentation on the issue of trajectory prediction for total hip and knee replacement and colon cancer in order to define the individual risk-adjusted payment for EDS and adjustment of individual results for the IPEP experiment. The third presentation, by David Bernstein (DGOS, Ministry of Health), was a synthesis of foreign experiments using risk adjustment. The fourth, by Marc-Antoine Sanchez, doctoral student at Hospinnomics and Créteil University, dealt with the introduction of quality indicators in France and the need to adjust them to the expected outcomes of patients. The fifth, by Alexandre Vimont, Ph.D. student at URC ECO (GPUH), was on the use of artificial intelligence-based models for forecasting healthcare spending. The last concerned the measurement of efficiency gains in IPEP experiments to calculate a bonus for groups of primary care professionals and was presented by Victor Bret and Cécile Billionnet from the CNAM. Hospinnomics also participates in the publication of a special issue on risk adjustment in the journal *Journal de Gestion et d'Economie de la Santé*.

SHORT WORKSHOPS AND CONFERENCES

Several events were organized by Lise Rochaix:

- In September 2019: the Journal of Management and Economics of Health (JGES) organized its 11th day on the theme "Payment for quality of care: economic and managerial aspects". Organized and coordinated by Lise Rochaix (Hospinnomics and Paris 1) and Étienne Minvielle (École Polytechnique).
- July 2020: EUHEA virtual conference (Lise Rochaix, outgoing President). Health Economics for Sustainable Systems notably devoted several sessions to research in health economics and the economic consequences of the COVID 19 pandemic. Interventions are available online: <https://www.med.uio.no/helsam/om/aktuelt/aktuelle-saker/2020/euhea-webkonferanse.html>



PUBLICATIONS

Scientific Publications

ARTICLES PUBLISHED IN REVIEWED JOURNALS

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