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Healthcare operations has been a major research programme at Cambridge Judge Business School since 2010, as part of the research portfolio of the school's Centre for Health Leadership and Enterprise. The team consists of three faculty members and will typically comprise three to five PhD students. We have a strong emphasis on practice-based research. Working closely with clinicians and managers in healthcare organisations, locally and internationally, gives us access to fascinating research settings and unique primary data. In return, we offer state-of-the-art analytics capabilities that our partners and their organisations often lack.

### Practice-based research

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Practice-based research is an approach to developing knowledge that is distinct from more traditional research approaches in management, which are, in our view, often too narrowly concerned with the development of generalisable theories, leading to elaborations of complex abstract concepts and a level of debate that is far removed from managerial practice and impact. By contrast, practice-based research starts from an engagement with management challenges faced by practitioners and seeks to develop and test insights in a concrete context first, before engaging with abstract and generalisable conceptual developments. This anchors any theoretical development in a specific practical context, which is used to triangulate generalisations and to translate abstractions into a language that can be understood and acted upon by practitioners.

### The process of practice-based research for PhD students

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PhD students who work with more traditional research approaches will spend most of their time in the early stages of their PhD on the academic literature, reading and understanding academic papers to try and understand how they can contribute to the academic debate in their field. By contrast, our PhD students engage at the outset of their programme in a series of practical projects with practicing clinicians and managers. This has several immediate advantages:

- Helping clinicians and their managers with a service improvement project is very satisfying and motivating on its own, in particular if there is a direct link to improved patient care.
- Practical projects provide value for the partner organisation and their staff, who are therefore happy to reciprocate when we ask them to support our research activities, e.g. by sharing data.
- Practical projects force our PhD students to engage with the realities of healthcare services on the ground and provide them with a thorough understanding of important practical complexities that theoretical models often neglect.
- Practical projects in complex contexts such as healthcare are a great source of novel research ideas.

Engagements with practitioners, if done well, will always throw up interesting phenomena, which we “dissect” as a team in our weekly research meetings, and try to relate to and explain with the existing operations management literature. This process reinforces and expands the discipline

knowledge that our PhD students obtain in their PhD courses. When an interesting phenomenon cannot be explained, or appears to contradict prevailing academic knowledge, then we have “struck gold”. We single out these projects for further “research treatment” and try to understand, grounded in the project and its data as a practical hook, where and why current academic knowledge falls short and how it needs to be expanded to explain the phenomenon. These ideas are then developed into papers, which form the basis for our students’ PhD theses and are submitted for publication to academic management journals (and sometimes to medical journals).

Through this process, our students:

- obtain a practice-based education in operations management theory
- obtain context knowledge in healthcare management
- learn to engage with clinicians and managers
- learn to develop novel ideas, grounded in real phenomena
- learn to write papers that contribute to academic debates and improve the practice of healthcare operations.

## **A glimpse of the research challenges in healthcare operations**

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To get a feel for the kind of challenges that we are facing in healthcare operations, it is useful to distinguish two perspectives: (i) the perspective of a “system operator” who is concerned with the organisation of an entire regional health ecosystem or who is an executive director of an organisation in this system, and (ii) the perspective of an operations manager in the “belly” of a healthcare organisation who is, on the one hand, responsible for the performance of the doctors and nurses who provide patient care in her unit and, on the other hand, for the contribution of the unit to the performance of the organisation and the health system as a whole.

**Designing and operating healthcare systems:** The fundamental challenge at the level of regional health ecosystem is the organisation, regulation and governance of a service provider landscape that ensures access to high-quality healthcare at affordable prices for the whole population. This is an increasingly difficult challenge, as advances in medical technology, aging populations and rising patient expectations increase cost pressures and constrain access. From a system management perspective, this challenge raises three related questions:

1. Who should provide which service and how should these providers be organised?
2. How should provider organisations be paid for their services so that their managers are incentivised to provide the appropriate level of care (i.e. don’t over- or undertreat)?
3. How can the different parts of the system be incentivised to cooperate and deliver seamless healthcare for a population from cradle to grave?

These are hard questions and any answer will be temporary and will change when demand and technology changes. For example, modern imaging and information technology greatly facilitates the centralisation of radiology services - regionally, nationally or even off-shore - and advances in data analytics are likely to lead to the automation of many of these services in the near future. Such technological changes are opportunities for individual organisations to provide healthcare at radically lower cost and even increase quality. But how are organisations responding to these opportunities? The answer is – poorly. Existing organisational and institutional structures exert significant inertia which delay and impede change, in particular change that could radically reduce cost and thereby broaden access for patients – but may not be in the interest of powerful stakeholders.

The most compelling example of organisational inertia in medicine is the development of the modern general hospital: The operational and business model of these organisations – as the home of specialist providers - is largely unchallenged and has been unchanged for almost a century. As a consequence, general hospitals have mushroomed in their offerings and have become so complex that many of them are unmanageable. What are the operational implications of this development? Do hospitals need to change their operational model to better leverage technological development and provide affordable high quality care? If so, how should hospitals “down-size”? Should some of their services be taken up by primary and community care providers? If so, which services? Or should there be different types of hospitals for different types of services? How can we make sure that any of these changes doesn’t harm further technological advance? If we break up hospitals, how should the new providers be incentivised to deliver the right level of care and, in particular, to cooperate along patient journeys? What is the role of electronic patient records in this integration challenge? Which healthcare services are best delivered by private firms, which are better delivered as public services?

For operations management academics, these system-level questions are reminiscent of supply chain challenges in the manufacturing and service industries, a subfield in operations management that has flourished over the past two decades. However, there are industry idiosyncrasies in health – not least the vulnerability of the patient as a service user and the importance of the doctor-patient nexus as the delivery mode - that require us to critically assess, adapt and sometimes reject existing knowledge from other industries.

**Managing in healthcare organisations:** Moving down into the “machine rooms” of the organisations that provide healthcare, we are confronted with the day-to-day challenges faced by operations managers in general hospitals, primary care practices, community care organisations, mental health clinics and other healthcare organisations. They are responsible for the performance of others – that’s what makes them managers – and these “others” are powerful knowledge workers (nurses, doctors, physiotherapists, etc.), who have specialist knowledge and expertise way beyond that of the manager. Clinicians have a strong sense of personal accountability for patients and strong professional norms. However, they will feel primarily responsible for their *own* service provided to their *own* patients and find it difficult to internalise organisation- or system-wide adverse effects of their decisions. It is the manager’s responsibility to ascertain that system-wide goals are maintained. That’s a hard job, arguably much harder than managing frontline staff in a retail or manufacturing organisation.

To make sure their clinicians work effectively, operations managers have to design and manage robust processes. This requires them to understand and take account of clinician behaviours and its drivers, for otherwise clinicians are likely to find ways (and good clinical reasons) for not complying with the processes. They might do this in their own personal interest but, more often, non-compliance is in the interest of delivering the best service to their own patients, while neglecting any system-wide effects on other patients outside the responsibility of the individual clinician. Designing and managing processes that work well in health systems is very hard and requires a great deal of creativity.

In fact, things become even more complicated when patient behaviours are factored in. This is important because healthcare services are not “delivered” but genuinely “co-produced” with the patient. The voice of the patient is an important, and increasingly more powerful input in clinical decisions and patient compliance with treatment regimes is a crucial contributor to outcomes. The study of this *clinician-patient nexus* and the environmental conditions that lead to better decisions and better outcomes for patients and for the health system as a whole is still in its infancy. We call

this field *behaviour healthcare operations*. It builds on the nascent field of behavioural operations and, more broadly, on insights from behavioural economics, applied psychology and the study of decision-making under uncertainty.

## What we expect from our PhD students

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- Our PhD students are passionate about the healthcare context and want to contribute to the overall goal of providing better healthcare services to more people
- Our PhD students have a clear career goal - to become academics in an operations management department of a business school. That's what we train them for.
- Our PhD students enjoy the rigour of academic work, the power of data, and in-depth methodological discussions.
- Since we make heavy use of analytics, our PhD students need a first degree that provides them with solid quantitative training, such as economics, engineering, operations research, statistics, epidemiology, mathematics, or a similarly quantitative subject.
- We work intensively with our PhD students and regard them as junior colleagues, not as students. In return, we expect a strong work ethic and a high degree of maturity, independence and critical thinking.
- Our PhD students enjoy working in diverse teams and are keen to engage with clinicians and managers of healthcare organisations.
- We appreciate managerial experience prior to the PhD but this is not a prerequisite. Similarly, prior experience of the healthcare industry is appreciated by not required.

## Current research students

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- Lidia Betcheva, BCom Finance and Economics (University of Toronto, Canada), MPhil Finance (Cambridge)
- Katherine Bobroske, BA Operations Research and Industrial Engineering (Cornell University, USA), MPhil Strategy, Marketing and Operations (Cambridge)
- Harshita Kajaria, BA Mathematics (New York University, USA), MPhil Strategy, Marketing and Operations (Cambridge), currently 1<sup>st</sup> year PhD (Cambridge)
- Tom Pape, BSc Business and Economics (University of Jena, Germany), MSc Management Science (London School of Economics)

## PhD alumni

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- [Michael Freeman](#), Assistant Professor, Technology and Operations Management Department, INSEAD
- [Nicos Sava](#), Associate Professor, Department of Management Science and Operations, London Business School
- [Yun-Shin Lee](#), Assistant Professor, Department of Operations Strategy and Management Science, Korea Advanced Institute of Science and Technology (KAIST), Seoul
- [Niyazi Taneri](#), Assistant Professor, Department of Decision Sciences, National University of Singapore Business School