

**Changes in healthcare service utilisation following the introduction of a complex technological innovation: the use of teleconsultations in Alentejo**Tiago C. Oliveira¹, James Barlow¹, Steffen Bayer¹¹ Business School, Imperial College London, London, UNITED KINGDOMContact: tiago.oliveira@imperial.ac.uk

Objectivos (Objectives): Technological change is considered the main driver of rising healthcare costs. As a number of new technologies are actually associated with lower unit costs, explanations have focused on changes in service utilisation: new technologies tend to expand treatment rather than substitute for it. In this study, we investigate the mechanisms through which the introduction of complex new technologies in healthcare leads to changes in the utilisation of services, and how these changes impact the costs associated with a specific technology.

Metodologia (Methodology): We use a case study design to investigate changes in utilisation and costs following the introduction of teleconsultations in three specialties in Alentejo, Portugal. Using the system dynamics methodology, from the field of operational research, we develop a model of the teleconsultation and face-to-face pathways in Alentejo. We then parameterise the model with operational data, evidence from the literature on teleconsultations and interviews with physicians and managers. Through simulation, we are able to test the validity, sensitivity, completeness and coherence of the hypothesised relationships. We can also test different scenarios and policy interventions, investigating, for example, the consequences of mainstreaming teleconsultations across the region.

Resultados (Results): Teleconsultations are quicker than face-to-face consultations, increase access to remote locations, have shorter waiting times, reduce NHS transportation costs, may reduce referrals through general practitioner learning and have the potential to reach 50 percent of all specialist consultations. On the other hand, teleconsultations currently represent only one percent of all specialist consultations, they may be inconclusive leading to subsequent face-to-face consultations, may introduce new inequities in access, and increase general practitioners' workload. Simulations with the preliminary model suggest the technology might be useful in dealing with an increasing demand for medical care; however the total costs associated with the technology may increase due to changes in service utilisation. Effects on waiting lists and referral rates are also explored.

Conclusões (Conclusions): A better understanding of how the introduction of new technologies in healthcare affects both patients' and physicians' decisions – and how these lead to service expansion, substitution or simultaneously both – can have implications for the larger question of how technological change raises healthcare costs. We also build on previous work around integrating economic evaluation methods with system dynamics models, in an effort to understand how we can assess technologies which expand services. Finally, we explore how technological innovation – and calls for more technological change – can actually lead to new challenges. Modelling and simulation provides a virtual world in which we can test the effects of current and future policy interventions without impacting on real world service delivery and outcomes.