

Healthcare demand modelling: a systematic review

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Understanding imbalances between the demand and supply of the health workforce is essential for the improvement of many health outcomes, such as equity access to healthcare services targeted by the United Nations Sustainable Development Goals in 2015. Within this context, it is crucial to have tools to support the distribution of the human health resources (HHR) considering the population needs. Many healthcare modelling exercises have been undertaken with the purpose of supporting the decision-making process. Despite the relevance of this topic, methodological weaknesses can be found in existing demand analyses. Different factors contribute to this situation. Firstly, the concept of demand for health professionals is not consensual, assuming different meanings for different people. For instance, the term demand is oftenly used to quantify the utilization of the healthcare services (which are determined by individuals, organizations, or policy-makers), but also to handle the healthcare needs of the population (e.g. through the use of incidence and prevalence rates). Unlike the former, the concept of need for HHR is normative with no economic and financial issues that might limit what is feasible (Dussault et al. 2008). These different assumptions create a source of misunderstanding in discussing shortages and surpluses of HHR. Secondly, there is a deficit of valid and accurate data on the health workforce in general, and in the demand-related indicators in particular, which compromises the building of robust models given the related uncertainty (Leone et al., 2013). Given the challenges to cope with, efforts have been devoted to the design and development of methods to model the demand of the human health resources. In particular, a great variety of studies can be found in the literature, differing on their nature (e.g. retrospective or prospective study), scale (e.g. local or national) and focus.

The aim of this study is to provide a systematic review of the literature surrounding healthcare demand modelling. This systematic review intends to answer the following key questions: How can healthcare demand be defined? How has healthcare demand been modelled? How to classify healthcare demand-based methods? What are the harms and barriers of modelling healthcare demand? The methodology of this systematic review was based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) statement (Moher et al., 2009).

Relevant keywords were used for the search through the PubMed/MEDLINE, SCOPUS and Web of Science databases, such as *healthcare demand modelling; estimating (planning or projecting) the demand (requirements or needs) for human health resources (manpower, health workers, health professionals or health workforce)*. Within the inclusion criteria, we have considered all the studies published in English and Portuguese, of any size or design that handle the process of modelling the healthcare demand for: (i) health workers (e.g. physicians, nurses, psychologists, health workers in general among others), and (ii) healthcare services in general or procedures resulting from certain health conditions. The papers found in the search results have been evaluated according to their title and abstract. The full text of the papers has been analysed when considered suitable for inclusion in this review. Thus, this study provides a guidance for an important component of the health workforce planning, from the notions of demand for health personnel to the identification and categorization of the demand-related methods present in the literature. Also, herein, opportunities and orientations for future research are highlighted.

Keywords

Healthcare demand, health service needs, systematic review, health workforce planning.

References

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