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Operational Research for Healthcare Emergency Planning at a Strategic Level
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1.1 Context
Operational Research (OR) is the discipline that applies analytical methods to help make better and more informed decisions. Most of the quantitative techniques (‘Hard OR’) are mathematical, statistical or computational in nature; they are frequently used to arrive at optimal or near-optimal solutions to complex decision-making problems. ‘Hard’ OR is based on the assumption that systems are objective aspects of reality – they are generally independent of the observer; ‘Soft’ OR methods by contrast can best be characterized as assuming that a system is defined subjectively – it is a reflection of the observer’s worldview (Wienke and Mustafee, 2015). Thus, ‘Soft’ OR expects the presence of a range of decision-makers or stakeholders who may all have differing and even conflicting objectives. The application of qualitative OR techniques in this sphere is to guide and structure the various stakeholders’ discussions and build a shared understanding. Strategic level planning (which is the focus of Volume 2 of this book) is generally characterized by the presence and the active involvement of various actors in the decision-making process. Thus, ‘Soft’ OR can be used as a starting point for discussion regarding an appropriate resolution approach that all participants are prepared to implement.

OR is a vast field of study! A reference to the ‘Wiley Encyclopedia of Operations Research and Management Science’ (Cochran et al., 2011) provides scholarly insights into the enormity of this discipline. The encyclopaedia is marketed as an ‘unparallel undertaking’ that is devoted towards the advancement of OR and is an eight-volume authoritative reference set made up of over 6,000 pages! The field of OR is also expanding! The International Abstracts in Operational Research (IAOR, n.d.) is an indicator of the growing literature in OR. IAOR indexes abstracts from OR/
MS journals as well as some specialized journals that are relevant to OR/MS research (IAOR, n.d.). It is maintained by the International Federation of Operational Research Societies (IFORS) and is quoted to be the ‘the only dedicated source for bibliographic and abstract information in operations research and management science’ (IFORS, n.d.). It consists of 68,000 abstracts from over 145 journal titles (Miser, 2000); the number of journals has now increased to approximately 180. Mustafee and Katsaliaki (n.d.) report that in 1961 the first issue of IAOR listed work on models of common processes in 35 categories, on problems in 11 arenas of application and on 31 types of related theory development. By 1975, the numbers in these categories had reached 47, 34 and 53, respectively, and by 1998 they were 66, 43 and 77. In the specific case of healthcare OR there is evidence that this continues to be a growing area of research (Brailsford et al., 2009; Mustafee et al., 2010; Katsaliaki and Mustafee, 2011).

1.2 The triple lens

A way to describe the sheer enormity of OR content is through the identification of broad categories of OR techniques, their domain of application (application area) and application context. As mentioned in the introductory chapter of Volume 1 of this book, this is important because readers must not only build an understanding of the analytical methods that are discussed in this book, they should in addition possess domain knowledge which is specific to their area of work or study, and further, they should carefully consider the context of application since the choice of particular OR techniques can be largely dictated by specific problems that are to be solved! It therefore follows that this triple lens of technique-application-context will help readers to better appreciate the practical application of OR, and the 26 studies that have been presented in Volumes 1 and 2 of this book have been structured keeping this in mind (an outline of Volume 2 is presented in Table 1.1). Readers are referred to Chapter 1 of Volume 1 for examples of the broad categories of technique, application and context, which is based on a separate piece of research that focuses on the development of a classification scheme for OR/MS (Mustafee and Katsaliaki, n.d.).

1.3 Structure of volume two: a triple lens approach for the study of OR for emergency planning at a strategic level

The application of OR methods in healthcare has been widely reported in literature (Jun et al., 1999; Brailsford et al., 2009; Mustafee et al., 2010,