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Christos P. Kitsos • Teresa A. Oliveira •
Francesca Pierri • Marialuisa Restaino
Editors

Statistical Modelling and Risk Analysis

Selected contributions from ICRA9,
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Preface

It is the ICRA's believe, and we repeat it also in this volume: Everything humans venture to do has some degree of risk involved in it. Even in our everyday life. That might be one of the reasons we are devoted to studying Risk, despite the risk. The plethora of research papers in the field is getting larger, and this might be one of the explanations that all the ICRA conferences are successful.

In principle Risk is defined as an exposure to the chance of injury or loss. Practically, it is a hazard or dangerous chance and is wondering about the probability that something unpleasant will take place. Therefore, the probability of damage, caused by external or internal factors has to be evaluated. The essential factors that influence the increment of the Risk are asked to be determined. That is why eventually we are referring to Relative Risk (RR).

Under this line of thought, we started the ICCRA (= International Conference on Cancer Risk Assessment) conferences on August 22, 2003, in Athens and we proceeded in Santorini, 2007 and 2009. We moved to Limassol, Cyprus 2011, with the essential adjustment to ICRA (= International Conference to Risk Analysis). ICRA5 moved to Tomar, Portugal, in 2013, in honor of Dr Lutz Edler, where actually the extension of Risk Analysis (RA) to Bioinformatics, Management and Industry was established. The Springer volume in 2013 provides the appropriate evidence.

Meanwhile ICRA6 moved to Barcelona, Spain, and it was jointly organized with the conference RISK2015. In 2017, the meeting ICRA7 was held in Chicago, in honor of Professor Ivette Gomes. One step forward, further from game theory, towards to more fields under risk, was offered by the second Springer volume, in 2018. ICRA8 took place in 2019, in honor of Professor Samad Hedayat and it was held in Vienna, Austria. Another step forward was given with the publication of the 3rd ICRA volume by Springer in 2022. This book provided an overview of the role of statistics in RA, by addressing theory, methodology and applications covering the broad scope of risk assessment in life sciences and public health, environmental science as well as in economics and finance. The conference also included as a main topic the Experimental Design, once it plays a key role in many of these areas.

ICRA8 brought together some of the most important researchers and practitioners working in both fields: Risk Analysis and Experimental Design.

ICRA9 took place in 2022 at Perugia, Italy. The extension of the subjects was even broader and the present volume, acting as a proceedings volume, reflects the situation. This meeting was supposed to take place in June 2021, but unfortunately due to COVID it was canceled at that time. A special thanks is addressed to the Local Organizing Committee, for being patient and determined to proceed, besides the restrictions and the pandemic impact all over the world.

In epidemiological studies, there is a need to identify and quantitatively assess the susceptibility of a portion of the population to specific risk factors. It is assumed that all the participants to the study have been equally exposed to the same possible hazard factors. The difference, at the early stage of the research study, is only due to a particular factor which acts as a susceptibility.

We, the people of ICRA, try all these years, with the conferences we organize in different places, to extend the field in scientific areas such as Food Science, Environmental Problems, Management, Economics, and Engineering, etc. Thanks to the interest of the distinguished participants, some improvements have been succeeded every time, in every conference. The Risk Analysis (RA) problem is not solely what in the Decision Theory, traditionally, is referred; in the early stages, it was also involved in political decisions. We had big and very profitable discussions, all the participants, at the early stages of ICRA conferences, where the Decision Analysis line of thought, in every meeting, was retreating and the supporters of such “solid line” were realizing the reality. Eventually, since Tomar conference in 2013, we have essentially improved the areas of application of RA.

Our thoughts are going to Dr Lutz Edler, DKFZ Germany, who was addressing successfully the stimulating and detailed discussions the first decade of the second millennium. Exchanging ideas remains the core value for ICRA, creative discussion can be always helpful to good will people—solid beliefs need a careful and detailed RA to be accepted. That is why we try to have a “general assembly meeting” at the end of the conference to discuss possible adjustments from the current ICRA to the next. We believe there is a further area for development: RA has been applied to different fields, where there is not the appropriate software to all the areas, such an example might be the area of Environmental Risk. As two of us have strong ties with ISI Committee on Risk Analysis (C. Kitsos, Chairman, Nov. 2013–Feb. 2015, T. Oliveira, Chairwoman, March 2015–today), our concern to RA and therefore to ICRA is a life target.

We deeply thank all the participants for the submitted papers. All the papers were reviewed by two independent reviewers, a tradition we try to keep, as it is a safe guide to keep our Quality Standards. We thank all the reviewers for their support to the final presentation of this volume. We are certain that all the participants

enjoyed the hospitality in Perugia. Our sincere thanks are addressed to Springer, and especially to Dr Eva Hiripi, for the many years of excellent and kind cooperation. We are looking forward to see the ICRA10.

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